# PIT AND QUARRY

MAY 6 1940

MAY, 1940

Developments in the American Lime Industry . . . New Concrete-Floor System . . . Processing Phosphate at Monsanto's Plant in Columbia . . . Mineral-Wool Operating Technique Improves

# LUDLOW-SAYLOR

**CONTROLLED-TEMPER SUPER-LOY**

## WOVEN WIRE SCREENS

**for super-severe service**

▼ ▼ ▼

## SUPER HARD, SUPER TOUGH, SUPER STRONG

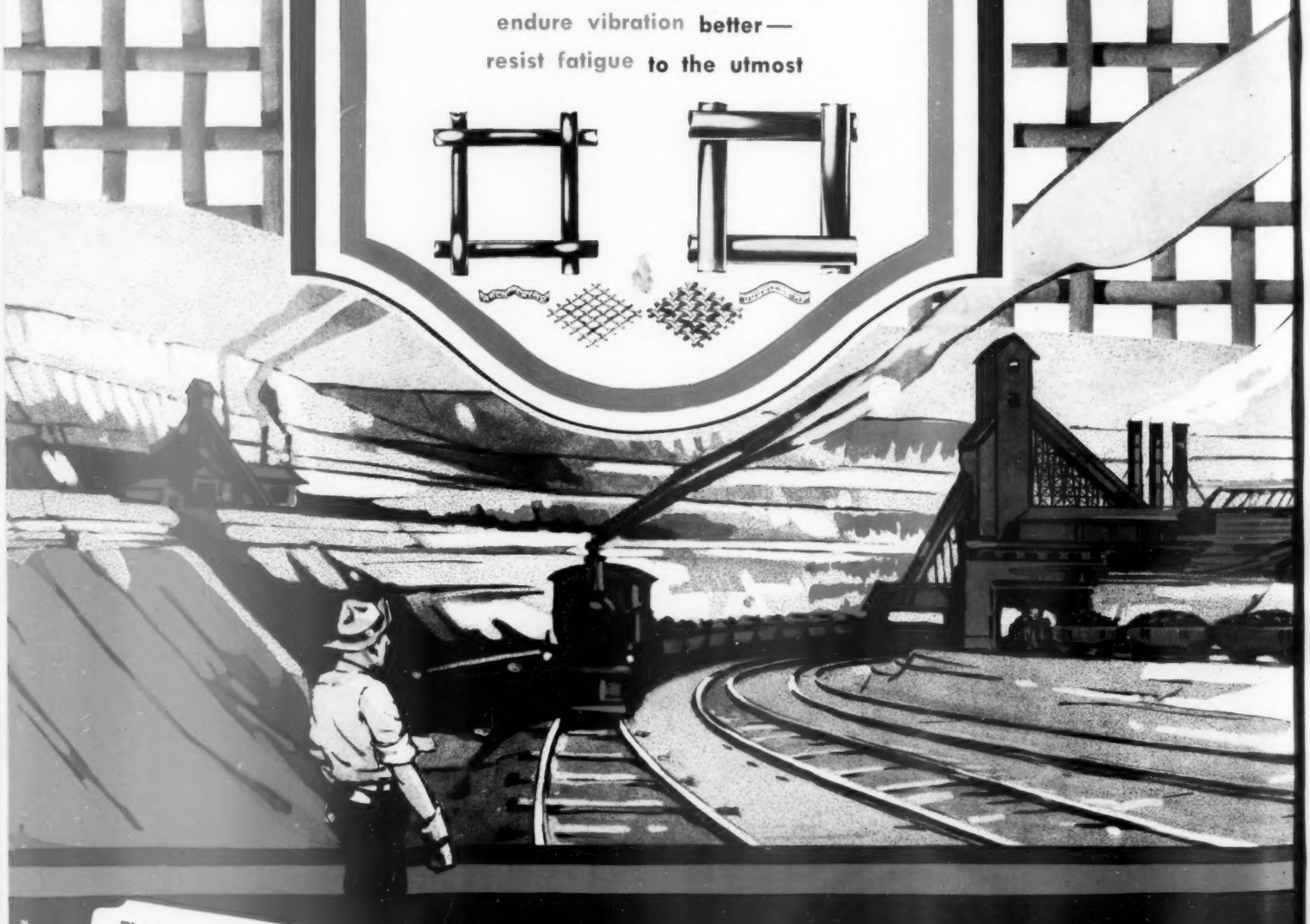
**CONTROLLED TEMPER SUPER LOY SCREENS**

withstand abrasion **longer**—

endure vibration **better**—

resist fatigue **to the utmost**





The background at top of page shows the "Perfect" Double-Crimp Weave.

The small cuts in the center panel compare Arch-Crimp Weave and Double-Crimp Weave.

The border at foot of page shows "Perfect" Double-Crimp Steel Wire Cloth which has been hot-dip galvanized after weaving.

Samples on request.

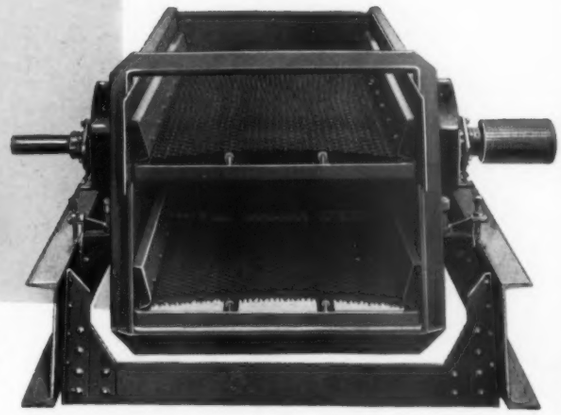
*The* LUDLOW-SAYLOR
WIRE COMPANY
SAINT LOUIS

# SCREENS

## VIBRATING SCREEN

For every screening requirement—rock, gravel or sand.
Sizes from 2'x4' to 4'x24'—2, 3, or 4 decks.
Eccentric shaft for positive action under all loads.
Balanced and counterbalanced to eliminate vibration.
SKF Anti-friction bearings for long life and economy.
Quick change sagless screens—no frames and no obstructions on top of screen.

*For complete information and details send for this booklet No. 526*



## REVOLVING SCREEN

For gravel or rock.
Particularly recommended for scrubbing, washing, and separating.
Standard screen for the small capacity job.
Heavy duty, anti-friction bearing screens for the big jobs.
Combination scrubber and screen for washing plants.

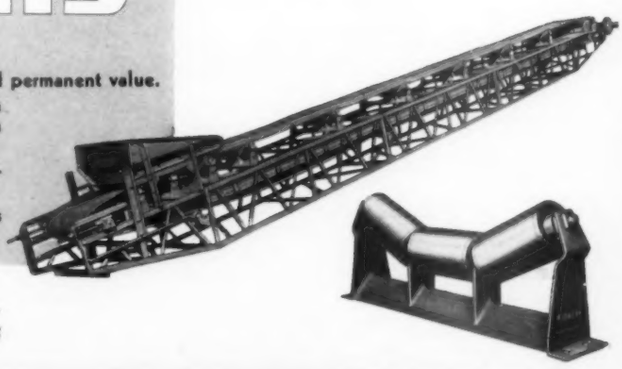
*For complete information and details ask for this booklet No. 502*

# CONVEYORS

## BELT CONVEYOR UNITS

For economical handling of bulk materials.
Standardized lattice frames for economical assembly and permanent value.
Dustless troughing idlers — both plain bearing and anti-friction bearing.
Self-cleaning decking for protection of belt.
Conveyor units and accessories for woodframe construction.

*For complete information and details ask for this booklet No. 528*



PIONEER ENGINEERING WORKS
1515 CENTRAL AVENUE MINNEAPOLIS MINNESOTA

PIT AND QUARRY, May, 1940, Vol. 32, No. 11. Published monthly by the Complete Service Publishing Company, 538 South Clark Street, Chicago, Ill. Subscription price $1 for 1 year in the U.S. and possessions, Canada, Central and South America; elsewhere $1 additional for each year. Single copies 20 cents. Entered as second-class matter February 28, 1932, at the Post Office at Chicago, Ill., under the act of March 3, 1897.

LOOK at the blueprint above and you'll see that the granite gang-saw drive we're talking about is really tough. 10¾ inch driving pulley —72 inch driven pulley—4 feet, 10 inches center to center with a 500-pound idler! That's a hook-up to eat the heart out of any belt.

And that's exactly what it did. The best "double" belts averaged one year's service with frequent take-ups to cut out stretch and slip. Then, in November, 1936, a Goodyear Compass "50" truly endless belt was installed on the recommendation of the G. T. M.— Goodyear Technical Man.

### *More than 3 times longer service—at 25% less cost!*

Today, after more than three times longer service than previous belts, the Goodyear Compass is still driving the saws through solid granite —and it's not worn out yet! It has neither stretched nor slipped, eliminating maintenance and repair expense.

But that's not all. This long-wearing Compass cost 25% LESS than the short-lived belts it replaced. If you're interested in savings like this on your belt-eating drives, call in the G. T. M. Just write Goodyear, Akron, Ohio, or Los Angeles, California — or phone the nearest Goodyear Mechanical Rubber Goods Distributor.

BELTS
MOLDED GOODS
HOSE
PACKING
Made by the makers of Goodyear Tires

THE GREATEST NAME IN RUBBER

GOODYEAR

Compass—T. M. The Goodyear Tire & Rubber Company

# WHAT IT TAKES TO DO THIS

# COMES FROM THIS!

## Ability To Concentrate Full Power . . . When and Where You Want It

● Lorain shovels can spot or spread their power as the digging demands. That's because their Thew Center Drive turntable offers direct power drive to each major power shaft. It is this direct-to-the-point power application, through the fewest number of parts, which enables you to—

1 Concentrate full engine power on any one operation to lick the toughest going (as above).

2 Distribute power over two or three simultaneous and synchronized operations to obtain smooth, fast, powerful working cycles.

For further evidence of the money-making advantages of Center Drive design, write today for book entitled "The Rocky Road To Success." You'll find facts aplenty to substantiate Lorains' reputation as real rock shovels.

**THE THEW SHOVEL CO.**
LORAIN, OHIO

THEW CENTER DRIVE
REG. U.S. PAT. OFF.

# LORAINS

# Greater, Effortless Speed on Stripping, Pit Work, Stock Piling, Loading!

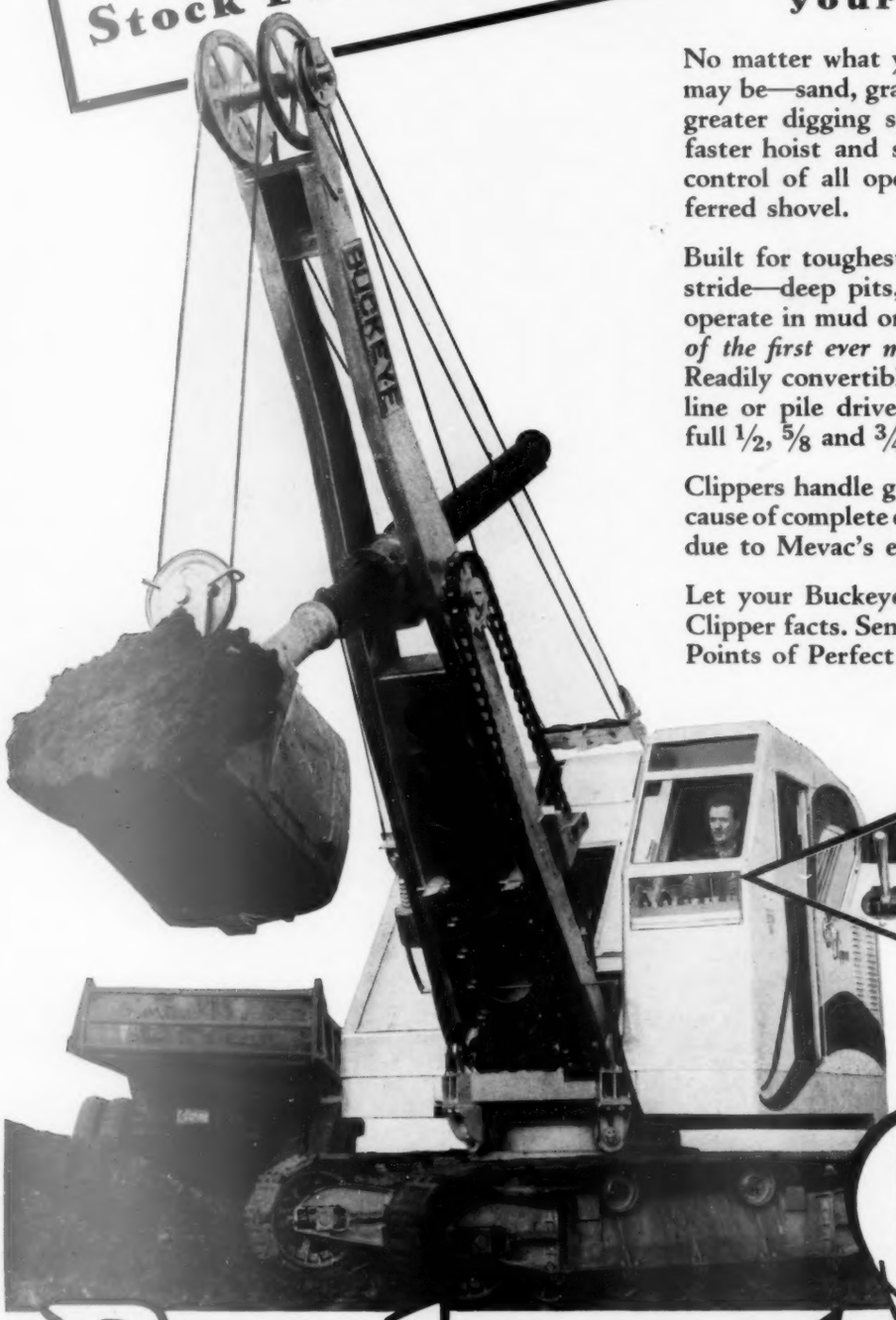
## Demand Mevac Vacuum Control for greatest yardage on your next shovel!

No matter what your digging or handling job may be—sand, gravel, rock or clay—a Clipper's greater digging speed, positive power crowd, faster hoist and swing—plus positive vacuum control of all operations — makes it the preferred shovel.

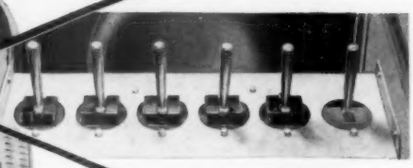
Built for toughest going, they take all jobs in stride—deep pits, high dumps, angle digging, operate in mud or water. (*Buckeye crawlers, one of the first ever made, are really non-clogging.*) Readily convertible to trench hoe, crane, dragline or pile driver. Made in oversize models, full 1/2, 5/8 and 3/4 yd.

Clippers handle greater yardage every hour because of complete elimination of operator fatigue due to Mevac's effortless action controls.

Let your Buckeye Distributor give you latest Clipper facts. Send for new bulletin, "Thirteen Points of Perfect Power Control."




MEVAC



EFFORTLESS VACUUM CONTROL

Buckeye Bulldozers with Buckeye G.L.T. Power Cable Control Unit provide faster, more economical back-filling, leveling, road and ramp building; ideal for all pit, quarry and stripping work.

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facts you can put your finger on
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100% CRUSHED GRAVEL and regular gravel
COMMERCIAL sand and gravel PLANTS
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LAYOUTS FOR MATERIALS DIFFICULT TO WASH

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G C-6-40

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# GET READY NOW FOR BIG

## . . . HERE'S YOUR MARKET TODAY and TOMORROW

HOWARD HALL, PRESIDENT — KENNETH LINDSAY, VICE PRES. — J. F. PLUMB, SEC'Y & TREAS.

**IOWA MANUFACTURING COMPANY**
BUILDERS OF
**CEDAR RAPIDS CRUSHERS**
MATERIAL HANDLING EQUIPMENT

CEDAR RAPIDS, IOWA

May 1940

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Anywhere
North America

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The present and future market for BLACK TOP is BIG. Over 2,000,000 miles of roads are not surfaced. Over 60% of America's 32,000,000 farm people live on unimproved roads which bad weather often makes impassable. Over 97% of the present surfaced roads are unfit for today's high speed traffic. BLACK TOP, because of its low first cost - its conservation of materials - and its flexibility of construction to meet the traffic load, prevailing weather conditions, kind of topography and character of sub-grade is equally appropriate for a farm-to-market road, a parking area, an airport runway or a city thoroughfare. Here is a tremendous market for the contractor who is equipped to meet these new demands in road construction.

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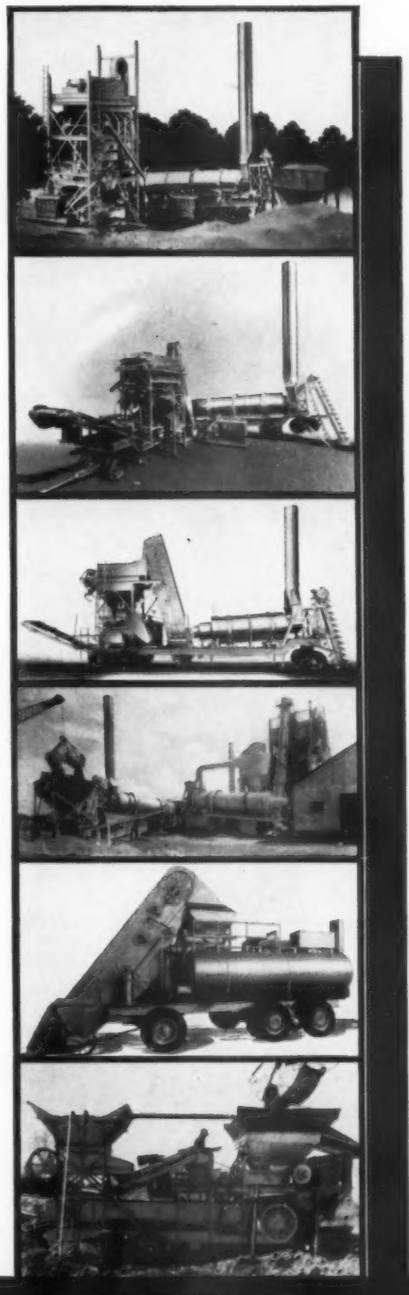
IOWA MANUFACTURING COMPANY
Kenneth Lindsay
Vice President - Sales Manager
KL/s

P. S. We also solicit your requirements for specially built equipment, designed and engineered to do your own particular jobs.

# BUSINESS IN BLACK TOP

## ...HERE'S YOUR EQUIPMENT
## A PLANT FOR EVERY JOB



**MODEL "A" KNOCK DOWN TYPE HOT MIX ASPHALT PLANT . .** The Cedarapids conventional type of hot mix plant. This model is built to meet individual requirements from standard Cedarapids units. Centralized controls — accurate grading and proportioning — thorough mixing — simplified erection. Available in 2000 lb. — 3000 lb. — 4000 lb. sizes. Bulletin AP-7.

**MODEL "B" PORTABLE TWO UNIT HOT MIX PLANT . .** Fully portable for quick moves and fast field erection. Portability offers extra cost saving opportunities and reduces time and labor. Has the same accurate controls and thorough mixing and batching features as model "A". For making cold mix, an additional drier unit may be added. Available in 2000 lb. size. Bulletin AP-8.

**SPEEDLINE PORTABLE HOT MIX PLANT . .** A complete 1000 lb. capacity plant, fully mounted on one truck. Can be taken anywhere with speed and economy — meets highway specifications for transportation — has the same accurate, thorough mixing and batching features of larger plants — will handle work impractical for larger and more expensive equipment. A money saver on small jobs. Makes bituminous construction possible in new fields. Bulletin SP-1.

**MODEL "C" HOT OR COLD MIX ASPHALT PLANT, KNOCK DOWN TYPE . .** The most efficient and economical stationary asphalt plant in the industry. Built to handle all types of bituminous material. Has drier-cooler combination, making possible either hot or cold mix as desired. A by-pass conveyor from the feeder to the second drier is used for hot mixes. A finely balanced plant for fast, smooth and accurate production that will meet the most rigid specifications. Capacities to suit any requirements. Bulletin AP-10.

**TRAVELING ROAD MIX MACHINE . .** An accurate — fast — low cost — self contained machine that picks up, mixes and delivers the finished product as it rolls down the road under its own power. Continuous mix type, 17'0" pugmill with renewable NI-HARD mixing paddles and manganese steel liners — accurate batcher and metering pump — 1000 gallon bitumen tank — centralized controls — single power plant — eight wheel drive — equalizing beam rear axle — pneumatic tires — hydraulic brakes. A large capacity, compact, portable plant.

**PORTABLE STABILIZER PLANT . .** A large capacity, portable plant that produces an accurate mix, proportioning any combination of calcium chloride, cement, oil, gravel, clay or soil and water. As many as three solids and two liquids can be proportioned and mixed together at the same time. Continuous type horizontal pugmill — clay-soil shredder — positive and accurate feeders—metering pumps—individual charging hoppers—mounted on pneumatic tires with equalizing beam assembly or on skids. This plant is simple to set up, easy to move and will produce large tonnage in tough, gummy material with economy. A big money saver. Bulletin STAB-1.

**Cedarapids**

**PORTABLE and STATIONARY**

CRUSHING PLANTS — ASPHALT MIXING PLANTS

WASHING PLANTS — MATERIAL HANDLING EQUIPMENT

IOWA MANUFACTURING COMPANY • CEDAR RAPIDS, IOWA

## Gardner-Denver UMB Drills Help Move 18,000 Yards of Gypsum Rock . . . Only One Minor Repair

That's only one example of the service you can expect from a Gardner-Denver UMB Universal Mounting Rig. On job after job, they've proved their ability to stand up to the tough requirements of quarry operation—to operate economically—with a minimum of upkeep.

## PROFIT FROM THE EXPERIENCE OF OTHERS!

ROCK production goes up when you buy a Gardner-Denver Wagon Drill! That's been *proved* time and again on the job. Experience records show that their double barrel savings mean extra profits for you. Low on air consumption—these drills are low on upkeep, too. Long hours of uninterrupted service are usual with Gardner-Denver Drills because they are built to give more footage per shift—*every* shift. We shall be glad to send you free bulletin showing you how to get your rock out faster—cheaper with Gardner-Denver Wagon Drills. Write Gardner-Denver Company, Quincy, Illinois.

## Gardner-Denver WDS Wagon Drills Show Profit on the Widest Range of Jobs

Quarry operators find drilling deeper holes is easier—more efficient with Gardner-Denver WDS Wagon Drills. A WDS will handle a ten-foot change of steel and drill in any position from 9° above the horizontal to vertical. Put them to work in your quarry—and watch the rock move out—fast.

**GARDNER-DENVER**
*SINCE 1859*

# LOUISVILLE BUILDS SEVEN DIFFERENT TYPES OF DRYERS!

As the nation's greatest specialists in rotary drying, we know it's utterly impossible for any *one* type of dryer to do an efficient job in *all* "pit and quarry" applications. . . . We have *proven* that in addition to the one type most often used in these industries, *three other* of our seven types have definite superiorities for various applications in your field. . . . We would welcome an opportunity to give you the facts. *Address:* Louisville Drying Machinery Co., *Incorporated,* 435 Baxter Ave., Louisville, Kentucky.

# "1-2-3" principle of . . . STRIPPING ECONOMY

**1** To *mechanical* Bulldozer digging with its high, powerful lift and low drop, that take trees, stumps and rock to a cleaning in a hurry . . . LeTourneau has added . . .

**2** . . . dynamite on wheels with a Rooter! . . . so you can get better fragmentation than blasting . . . at but *one-third* the cost, in a fraction of the time . . .

**3** . . . thus, with Carryall Scrapers handle a wider range of materials than ever before. Combined, these three produce the lowest rate of stripping per equipment investment that the industry has to offer.

*Ask your LeTourneau and "Caterpillar" dealer to demonstrate . . . NOW!* R. G. LeTOURNEAU, INC., *Peoria, Ill., Stockton, Calif.*

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## *Stripping* EQUIPMENT

CARRYALL* SCRAPERS, ANGLEDOZERS* BULLDOZERS, ROOTERS*, POWER CONTROL UNITS, DRAG SCRAPERS, PUSHDOZERS SHEEP'S FOOT ROLLERS, CRANES, BUGGIES*, TREE-DOZERS.

*Name Reg. U. S. Pat. Off.

# LIMA

## FITS INTO ANY EXCAVATING PICTURE

Whether your work requires a shovel or dragline, you will find in LIMA'S complete line, a machine that will fit your requirements exactly. LIMA excavators are built in sizes ranging from ¾ yard to 3 yard capacity, with ability to handle the toughest job.

1 Special steels are used throughout to effect longer and profitable operation, with fewer delays.

2 Arrangement of machinery affords proper balance for handling long booms at low angles.

3 Independent clutches — h o i s t, travel, swing and boom up or down simultaneously.

**These are a few of the advantages that are yours when you own a LIMA.**

4 Big diameter drums with wide faces effect greater cable economy.

5 Roller bearings at every vital bearing point, reduces friction to a minimum.

6 Helical cut gears throughout the main machinery affords smooth, quieter operation.

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Turn losses into profits the self-liquidating DEMPSTER-DUMPSTER way. One unit serving 5 to 10 detachable buckets does the work of 5 trucks. Labor is never idle . . . with DEMPSTER-DUMPSTERS on the job, "waiting for a truck" becomes a forgotten phrase. Drop-bottom buckets, carried on the truck well ahead of the rear axle, contribute to long truck life and low maintenance. Sizes available up to six cubic yards.

ABOVE—Loading proceeds without interruption with DEMPSTER-DUMPSTERS . . . without a truck in sight! RIGHT—Note how easily the Drop-Bottom buckets are dumped . . . a one-man operation handled from the truck cab. The swing to DEMPSTER-DUMPSTER has been little short of amazing. See your distributor or write for the facts . . . TODAY!

*Exclusive sales territory available for responsible dealers. Write for details.*

**DEMPSTER BROTHERS, Inc.** KNOXVILLE, TENNESSEE

# The New 75W BUCKET LOADER

HAISS

## FOR THE MAN WHO CARES

The new, wheel-mounted Model 75W sells at a popular price, but it is not built to bait a man into buying it by reason of a bargain price tag. Haiss doesn't build that kind of equipment . . . But if you have need to handle a lot of material from scattered stock-piles, here is a machine to cut your loading cost down to a bed-rock minimum. The 75W has what you've been looking for!

## ON PNEUMATIC TIRES

- 3 cu. yds. per minute
- 3½ miles per hour travel
- Low crowding speed
- Enclosed transmission
- Clutches and gears run in oil
- One piece, forged buckets
- Haiss feeding propellers
- Balanced elevator
- 10 ft. chute clearance
- 35 H.P. Waukesha Motor

**GEORGE HAISS MANUFACTURING COMPANY, INC.**
142nd Street and Rider Avenue
New York, N. Y.

*Something* TO FIND OUT ABOUT!

Please send me AT ONCE a complete description of your new 75W pneumatically-tired Loader.

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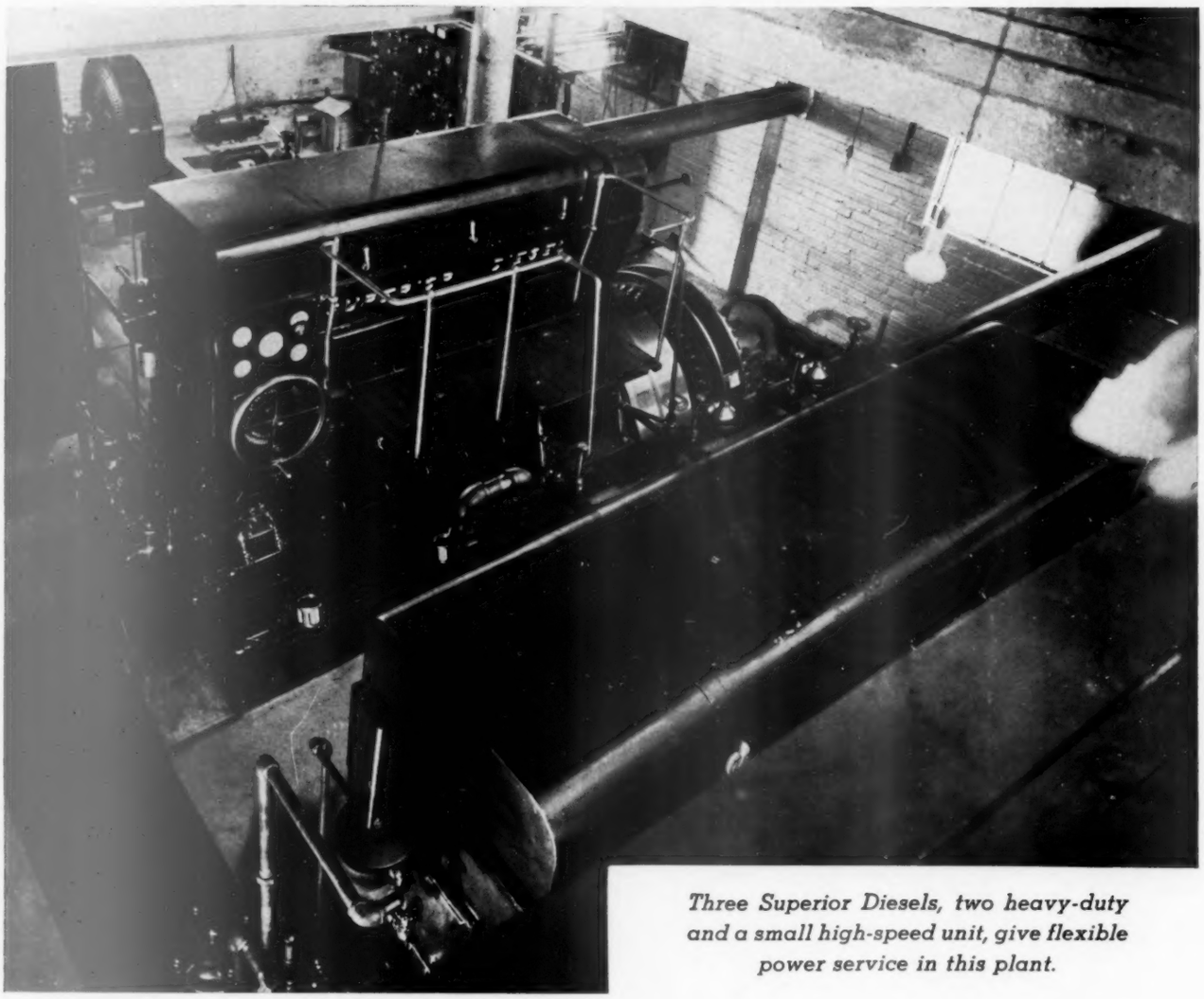
Name of Company .....

Street & No. ..... City ..... State .....

# THIS SUPERIOR DIESEL PLANT CUT POWER COST FROM $1000 TO $300 MONTHLY



*Three Superior Diesels, two heavy-duty and a small high-speed unit, give flexible power service in this plant.*

● The two large engines, installed in this Eastern Pennsylvania plant seven years ago, immediately reduced power bills $700 per month.

Naturally, the equipment has long ago paid for itself from savings.

A typical year's operation shows an average generating cost under 6 mills per **KWH** exclusive of fixed charges.

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You can expect **FACTS** from our 52 years' experience.

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**SHOVELS**
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**PULL-SHOVELS**
**CRANES**
**WALKERS**

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From 3/4 Cu.Yd. to 35 Cu. Yds.
Gasoline - Diesel - Electric

MODERNIZE *with* MARIONS

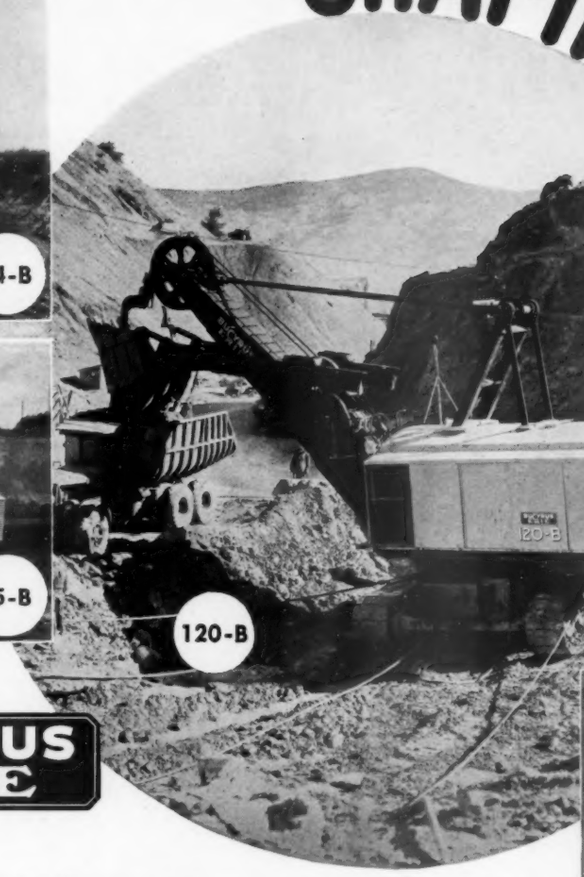
### A MARION Clamshell does the trick for Marblehead Lime Company . . . .

The speed and mobility of this Marion Type 331-3/4 cu. yd. clamshell are decided assets to the Marblehead Lime Co., Hannibal, Mo. Operating as clamshell, crane, and shovel, it is not only used in the stock yard for moving and unloading agricultural limestone, but is also employed to advantage on various excavating and erecting projects. Marion's adaptability to varied needs is a profitable solution of problems requiring quick, economical material handling. May we send full information?

THE MARION STEAM SHOVEL COMPANY
MARION, OHIO, U. S. A.

# MARION

# CHAMPIONS ALL




BUCYRUS ERIE

FROM these five world-famous Bucyrus-Erie heavy-duty excavators, you can select the machine best suited for your big output jobs. The 2½-yard 54-B, the 3¼-yard 85-B, the 4-yard 100-B, the 5-yard 120-B and the 6-yard 170-B—are all "years ahead" champions springing from a long line of outstanding ancestors. Since 1880 Bucyrus-Erie has been accumulating the experience that has gone into making today's Bucyrus-Erie quarry and mine type machines the best heavy duty digging tools that can be built. Field service on all kinds of jobs, all over the world, has proved their capacity for big output in tough digging, for ability to give continuous low-cost service with a minimum of maintenance worry. This line of excavators leads in sales around the world because each machine has the engineering of tomorrow — for your jobs today.

# Bucyrus·Erie

038

SOUTH MILWAUKEE, WISCONSIN

# PIT AND QUARRY

Vol. 32 MAY, 1940 No. 11

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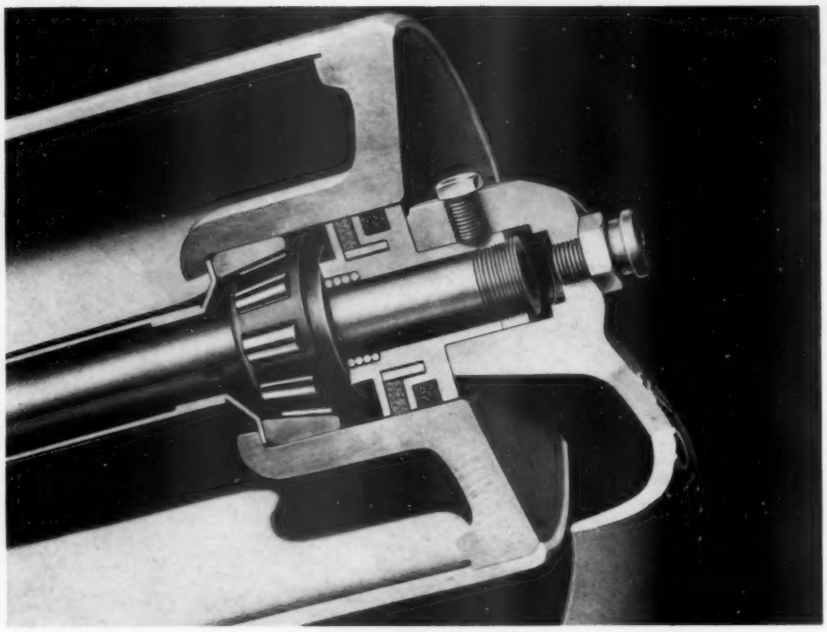
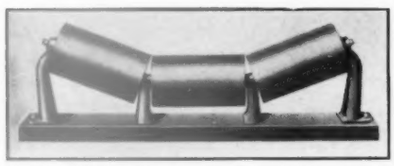
# IDLERS *that are* DIFFERENT



*Bearing and Seal assembly at outer end of idler pulley*

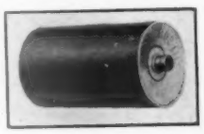
The Robins Improved Troughing and Return Idlers for Belt Conveyors have been completely redesigned for greater strength, longer life and lower maintenance. Every user



*Improved Troughing Idler*

should study the features of these new Idlers and consider their economic advantages.

The Troughing Idlers have pulleys of 5″ or 6″ diameter of either steel or one-piece cast iron. A rigid TRUSS construction is used. The pulley shafts are firmly held in malleable iron brackets of streamlined design and crescent section, securely bolted to a strong channel base,—

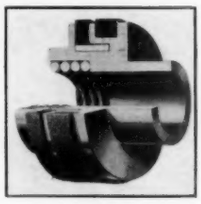


*Pulley and Shaft Assembly*

the shafts, brackets and base forming a vibration-proof TRUSS.

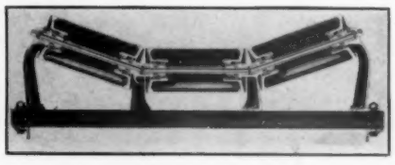
The three Pulley Assemblies are identical. Each is composed of the pulley, its bearings, seals, shaft and lock nuts. Radial and thrust loads on the pulleys are carried by Timken tapered roller bearings, the proper functioning of which is assured by positively locked screw adjustment plus wear-take-up springs.

Complete protection of each bearing against entrance of grit or moisture, or leakage of grease is assured by the triple grease seal in which both cork composition and woven felt washers are combined with a metal labyrinth. The cork and felt rings, free to rotate between the seal flanges, are a tight fit in the bore of the pulley and turn therewith. All Robins Idlers have the patented Single-Shot Lubrication by which grease injected at either one of two fittings, located at the ends of the idler in the safest and most accessible location, fills all six bearing chambers.



*Grease Seal*

The redesigned Return Idler is equally improved. It is exceptionally sturdy and capable of sustaining heavy loads. The pulley with its

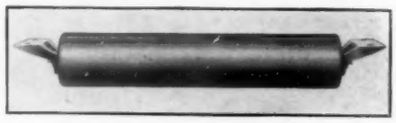


*Internal Grease Passage*

shaft, bearings, seals and locks is a unit assembly supported by malleable iron brackets. This pulley assembly may be lifted out of the brackets without disturbing the bracket attachment or the adjustment of bearings.

The pulley is made of heavy steel tubing 5″ or 6″ diameter with cast heads pressed in. Within each head is a Shafer Self-Aligning Roller Bearing, protected by a triple seal same as used in troughing idlers. Surrounding the shaft between the pulley heads is a grease reservoir permitting the lubrication of both bearings from either one of the two pressure fittings.

Robins Improved Idlers are interchangeable with older types of Robins Idlers as well as other makes.



*Improved Return Idler*

Replace worn Idlers with Robins Improved Idlers. Every replacement thus made is one step toward modernizing your conveying system.

*Send for information on Belt Conveyors, Screens, Screen Cloth, Bucket Elevators, Feeders, Weigh Larries, Bin Gates, Grab Buckets, Car and Barge Hauls, Unloading Towers and Skip Hoists.*

MATERIAL HANDLING ROBINS EQUIPMENT

**ROBINS CONVEYING BELT COMPANY, PASSAIC, NEW JERSEY**

## Permanente Considers Long Pneumatic Line

**BIDS LOW ON 1,500,000 BARRELS**

The longest pipe-line for conveying cement by the Fuller-Kinyon system—12 miles in length—is being considered by the Permanente Corporation for transporting cement from its new plant at Los Altos California, to a loading dock at some point on Lower San Francisco Bay. Whether such a transport line would be feasible and economical has not been definitely determined as yet.

The Permanente concern, which built its plant after winning a government contract to supply all the cement to be used in constructing Shasta Dam, only recently submitted the lowest bid for furnishing 1,500,000 barrels of low-heat cement for the Central Valley Project. Its newest offer is 97¾ cents per barrel, compared with its winning bid of $1.19 for the Shasta Dam project. Another company bid even lower, however, on a smaller lot. The Riverside Cement Company and the California Portland Cement Company, submitted a joint bid to supply the full amount at $1.10 per bbl. from Colton and $1.04 from Crestmore on a delivery schedule of 3,000 barrels a day and 75,000 barrels monthly. The Permanente Corporation bid 97¾ cents per barrel on the full amount, with no delivery schedule. The Monolith Portland Cement Company bid $1.22 less 10 per cent. in 30 days on 1,000,000 barrels, to be delivered 3,000 barrels daily and 80,000 barrels monthly. Monolith bid on lesser quantities, all with the 10 per cent. 30-day discount, as follows: 305,000 barrels, $1.04, delivery in April, May and June; 350,000 barrels, $1.15 for delivery April-November; 125,000 barrels, $1.27 for delivery July-November; 395,000 barrels, $1.22 for delivery December 1940-Mav 1941.

The Calaveras Cement Company bid 90 cents, with no discount, on 150,000 barrels, to be delivered 2,250 barrels a day and 53,000 barrels a month. The Pacific Portland Cement Company bid $1 per barrel less 10 per cent. in 10 days for 330,000 barrels to be delivered 1,200 daily and 30,000 monthly from Redwood Harbor. The Beaver Portland Cement Company bid $1.65 with no discount on a maximum of 165,000 barrels to be delivered 600 daily and 14,000 monthly from Gold Hill, Oregon. The Santa Cruz Portland Cement Company bid $1.15 per barrel, with no discount on a maximum of 300,000 barrels to be delivered 1,000 daily and 25,000 monthly. The Yosemite Portland Cement Co. bid $1.02 with no discount on a maximum of 350,000 barrels to be delivered 1,250 daily and 31,250 monthly from Merced.

## Coming Events

*May 7-9, 1940—Cincinnati, O.* Annual convention, National Concrete Burial Vault Association, Netherland-Plaza Hotel.

*May 16, 1940—Chicago, Ill.* Semi-annual meeting, Board of Directors, National Ready Mixed Concrete Association, Palmer House.

*May 16, 1940—Chicago, Ill.* Special meeting, centennial celebration of first manufacture of mineral wool, National Mineral Wool Association, Chicago Towers Club.

*May 13, 14, 15, 1940—New York, N. Y.* Spring meeting, Portland Cement Association, Waldorf-Astoria Hotel.

*May 21, 22, 23, 1940—Chicago, Ill.* Twenty-second annual convention, National Lime Association, Drake Hotel.

*June 13, 14, 1940—White Sulphur Springs, W. Va.* Fifth annual convention, National Industrial Sand Association, Greenbriar Hotel.

## $5,000,000 Magnesium Works for Gulf Coast

**DOW TO BUILD AT FREEPORT**

The Dow Chemical Company has announced plans for the construction of a $5,000,000 plant at Freeport, Texas, for the purpose of extracting magnesium from the ocean.

The company, which has pioneered in the use of sea water as a chemical source with its bromide plant on the North Carolina coast, stated that the Freeport unit will be completed by late summer of this year.

The company's current output of magnesium is approximately 6,000,000 pounds annually. This will be doubled when the new plant goes into production, the company said.

Construction contracts have been let by the company under supervision of the Austin Company of Cleveland.

## Ford Adds Equipment at Dearborn Cement Plant

Improvements in grinding equipment made recently at the Portland-cement plant operated by the Ford Motor Company at Dearborn, Michigan, have stepped up capacity from 2,000 to 2,600 barrels per day.

The Ford plant, operating two 10-foot by 150-foot kilns, uses the wet process and much of its raw material is slag from the company's River Rouge blast-furnaces.

## U. S. Railroads Spend $9,203,000 for Ballast

Purchases by Class I railroads in 1939 included $9,203,000 for ballast, according to a recent release by the Association of American Railroads.

The second annual Missouri Mineral Industries Conference was held April 26 and 27 at the Missouri School of Mines, Rolla.

**The Portland-cement industry in February, 1940, produced 5,041,000 barrels, shipped 4,905,000 barrels from the mills, and had in stock at the end of the month 25,895,000 barrels, according to the Bureau of Mines. Production and shipments of Portland cement in February, 1940, showed decreases of 8.4 and 2.8 per cent., respectively, as compared with February, 1939. Portland-cement stocks at mills were 7.5 per cent. higher than a year ago. These statistics are compiled from reports for February received by the Bureau of Mines from all manufacturing plants.**

## North American's Sales Show 38 Per Cent. Gain

Shipments by North American Cement Corporation during 1939 increased 38 per cent. over the previous year and its plants operated at 49.2 per cent. of capacity, John J. Porter, president, said in his statement to stockholders recently.

During the year net capital expenditures of the company totaled $224,370, the principal items being a mortar-cement plant at Security Maryland, air separators and changes in the packing department at Catskill, New York, and a new storage warehouse at Howes Cave, New York, now under construction.

The average net selling price of cement received by the corporation showed a small increase in 1939 over 1938.

**RECENT GOVERNMENT CONTRACTS FOR MATERIALS UNDER THE PUBLIC CONTRACTS (WALSH-HEALEY) ACT**

| Date of Delivery 1940 | Supplier | Government Agency | Commodity | Amount[1] |
|---|---|---|---|---|
| 6/30 | Lee Lime Corp., Lee, Mass. | Agric. PS&T | Pulverized limestone | Indefinite |
| 6/30 | D. U. Smith & Bro., Ashley Falls, Mass. | Agric. PS&T | Ground limestone | Indefinite |
| 6/30 | Riverside Cement Co., Los Angeles, Calif. | W. P. A. | Portland cement | Indefinite |
| 6/30 | Monolith Portland Cement Co., Los Angeles, Calif. | W. P. A. | Portland cement | Indefinite |
| 4/15 | Maloney Materials Corp., New York City | W. P. A. | Broken stone | $10,380.00 |
| Indef. | The Midland Slag Co., Midland, Pa. | W. P. A. | Slag | 11,300.40 |
| 5/23 | Material Service Corp., Chicago, Ill. | W. P. A. | Portland cement | 14,202.50 |
| 6/30 | Allhoff Bros., Inc., St. Louis, Mo. | W. P. A. | Portland cement | 55,675.00 |
| Indef. | Union Portland Cement Co., Denver, Colo. | Interior reclamation | Cement | 13,680.00 |
| Indef. | Monolith Portland Cement Co., Los Angeles, Calif. | Interior reclamation | Cement | 12,560.00 |
| 6/30 | Boston Sand & Gravel Co., Cambridge, Mass. | Boston Navy Yd. | Ready-mixed concrete | 37,800.00 |
| 6/30 | Chemical Lime Co., Inc., Bellefonte, Pa. | Agric. PS&T | Pulverized limestone | Indefinite |
| 6/30 | I. K. Craft, Punxatawney, Pa. | Agric. PS&T | Pulverized limestone | Indefinite |
| 12/31 | Qualkinbush Bros., Paoli, Ind. | Agric. PS&T | Agric. limestone | Indefinite |
| 12/31 | Kissling, Lutgring & Son Stone Co., Tell City, Ind. | Agric. PS&T | Ground limestone | Indefinite |
| 12/31 | William Harrington, Moores Hill, Ind. | Agric. PS&T | Ground limestone | Indefinite |
| 12/31 | Felix A. Dunn, Gasport, Ind. | Agric. PS&T | Agricultural Lime | Indefinite |
| 12/31 | Bloomington Crushed Stone Co., Inc., Bloomington, Ind. | Agric. PS&T | Stone Dust | Indefinite |
| 12/31 | Joseph H. Bachman, Lanesville, Ind. | Agric. PS&T | Agric. limestone | Indefinite |
| 12/31 | Martinsburg Stone Co., Bloomington, Ind. | Agric. PS&T | Stone dust | Indefinite |
| 12/31 | Mid-West Rock Products Corp., Indianapolis, Ind. | Agric. PS&T | Agric. limestone | Indefinite |
| 12/31 | Quimby and Stephen, Stanford, Ind. | Agric. PS&T | Ground limestone | Indefinite |
| 7/15 | Lawrence Portland Cement Co., New York City | Agric. PS&T | Ground limestone | Indefinite |
| 6/30 | Ready-Mix Concrete Co., Ltd., Honolulu, T.H. | Pearl Harbor Yd. | Ready-mix concrete | $11,000.00 |
| 6/30 | New Castle Lime & Stone Co., New Castle, Pa. | Agric. PS&T | Pulverized limestone | Indefinite |
| 6/30 | Conklin Limestone Co., Inc., Canaan, Conn. | Agric. PS&T | Ground limestone | Indefinite |
| 6/30 | Clifford L. Miller, West Stockbridge, Mass. | Agric. PS&T | Pulverized limestone | Indefinite |
| 7/15 | Royal River Mills, Inc., Yarmouth, Maine | Agric. PS&T | Pulp mill lime | Indefinite |
| 7/15 | Lee Lime Corp., Lee, Mass. | Agric. PS&T | Pulverized limestone | Indefinite |
| 7/15 | Rockland-Rockport Lime Co., Inc., Rockland, Maine | Agric. PS&T | Ground limestone | Indefinite |
| 7/15 | D. U. Smith & Brother, Ashley Falls, Mass. | Agric. PS&T | Ground limestone | Indefinite |
| 5/10 | Standard Bitulithic Co., New York City | W. P. A. | Surfacing mixture | $12,947.85 |
| 12/31 | Walter Boyles, Guilford, Ind. | Agric. PS&T | Ground limestone | Indefinite |

## Private Building Up; Offsets Public Drop

### RESIDENTIAL WORK DECLINES

The dollar total of private-construction contracts awarded in the 37 eastern states during the month of March was 2½ per cent. greater than the total for March 1939, according to F. W. Dodge Corporation. This March record, added to previous gains, gave to the first quarter's private construction volume a moderate lead over the first quarter of last year, though the increase was not sufficient to offset the declines that have taken place in public-construction contracts. In March, contracts for public building and engineering projects ran 26 per cent. behind March of last year; the March total of all construction contracts aggregated $272,178,000, compared with $300,661,000 in march 1939.

Commercial and manufacturing-building contracts showed marked gains. Residential building, amounting to $121,708,000, was slightly under the figure for March of last year, partly due to predominance of low-priced small houses in the current program, and partly due to slowness of the U.S.H.A. public housing program. Public works and utilities contracts were only slightly under the March 1939 figure.

While the residential building contract total for the first quarter of the year ran about $10,000.000 behind last year's first quarter, it was ahead by 2,646 new family units. That the prolonged severity of the winter affected first quarter results is likely. March reports of the Federal Housing Administration on increased numbers and value of mortgages selected for appraisal are considered by the industry as indicating markedly increased residential building activity in the second quarter.

## Gains in Car-Loadings Seen for Quarter

An increase of 7 per cent. in car loadings of cement is expected during the second quarter of the current year as compared with the corresponding 1939 period, according to estimates compiled by the thirteen Shippers' Advisory Boards and made public March 31. It was indicated that cement loadings will reach 167,764 cars in the 1940 second quarter, as against 156,803 in the same period last year.

Also forecast for the current year second quarter, as compared with the corresponding 1939 period, was an increase in gravel, sand and stone car loadings of 0.1 per cent., from 295,746 to 295,989; and a 6 per cent. gain in lime and plaster car loadings, from 37,433 to 39,687.

## New Producer Builds at Three Locations

### OPERATIONS START AT RED HILL

The Superior Stone Company of Raleigh, North Carolina, was incorporated in August, 1939, by former officers of the Raleigh Granite Co. of that city. Officers are: W. H. Ragland, president; W. T. Ragland, vice president and general manager; E. U. Ragland, secretary, treasurer and operating manager.

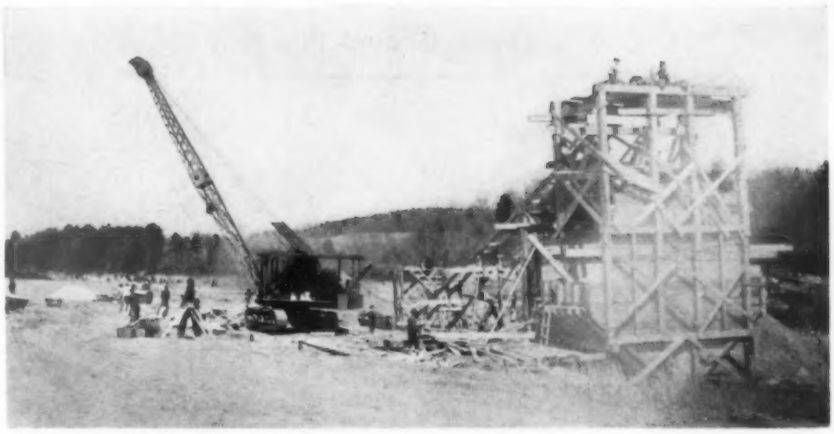
On March 11, 1940, this company put in operation a new crushed granite plant with a capacity of 200 tons per hour at Red Hill, Virginia. Equipment involved includes two Easton 10-12 cubic yard truck and semi-trailer units, a Traylor 42- by 48-inch jaw primary crusher, a 3-foot Symons cone crusher, a Tyler vibrating screen and two Robins screens.

At Dunn, near Fayetteville, North Carolina, the company is building a new 150-ton per hour sand and gravel plant. A dragline will be used in the pit. Operations there are expected to begin about May 1.

At King's Mountain, near Gastonia, North Carolina, the company is building a crushed limestone plant which is also expected to be in operation by May 1. A Traylor 14-inch gyratory crusher has been installed for primary breakage of the stone brought from the quarry in trucks. A belt conveyor will feed a Tyler Ty-Rock 2-deck screen and a smaller screen in series. Oversize stone will be returned on a belt conveyor to a Symons 3-foot cone crusher which will feed back on the main belt. Cars and trucks will be loaded from a 150-ton bin.

In about a year after the quarry has been opened sufficiently a large jaw crusher will be installed at the quarry and this will be fed by semi-trailers. A conveyor will carry the stone to the gyratory crusher which will then serve as a secondary unit. Another large screen will be installed in the plant. These changes are expected to double the plant's present capacity which is about 100 tons per hour. A 2-cubic yard Bucyrus-Erie steam shovel is used in this quarry and a similar shovel is used at Red Hill.

Gyratory primary and cone secondary crushers in the King's Mountain plant.



The new King's Mountain plant of the Superior Stone Company under construction.

## Seeks U. S. Control of Occupational Diseases

Senate Bill 3,461, introduced by Senator Murray of Montana, seeks to place the control of occupational diseases with the Federal government instead of the states as at present.

The bill, if enacted, would give the Secretary of Labor authority to reject any state occupational-disease law which, in the opinion of the secretary, was defective legislation. In general, it would establish a single national standard for such legislation and would grant Federal aid to the states to promote safety and abolish hazards.

## Columbia Cement Adds to Storage Capacity

An expansion program involving the expenditure of about $100,000 is in progress at the East Fultonham, Ohio, plant of the Columbia Cement Division, Pittsburgh Plate Glass Company.

Ten reinforced-concrete storage silos with a capacity of 75,000 barrels have been erected by the MacDonald Engineering Company, Chicago. New packers, bins, conveyors, etc., are also to be installed.

## National Gypsum Plans Warehouse at Mobile

The National Gypsum Company, of Buffalo, proposes the early erection of a $150,000 warehouse at Mobile, Alabama.

An Eagle Iron Works washer and a Diesel engine are recent additions at the Junction City, Kansas, plant of the More Sand Company.

## Complete Establishment of Walker Fellowship

The Stanton Walker Fellowship of the National Sand and Gravel Association has now been established at the University of Maryland, according to a bulletin issued by V. P. Ahearn, executive secretary of the association.

Decision to establish the fellowship was made at the 1940 convention held in St. Louis in January. An appropriation of $1,800 was also made to cover the costs for a two-year period.

## Kosmos Closes Plant for 6-Week Period

The plant of the Kosmos Portland Cement Company at Kosmosdale, Kentucky, was shut down on April 6 with all storage bins full.

The shut-down is expected to last about six weeks and during that time a number of improvements are to be made.

## Ohio River Sand Co. Asks Dredging Permit

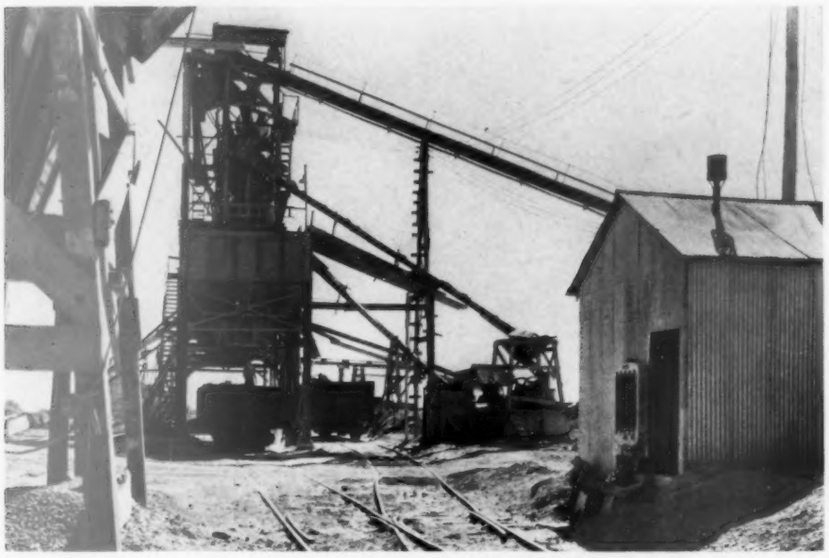
The Ohio River Sand Company, Louisville, has applied to the office of the United States Engineers at Louisville, for a permit to dredge sand and gravel, to be placed on shore for commercial purposes, in the Ohio River between Lonesome Hollow Creek, Indiana, and Dam No. 45.

## Two Die, 80 Escape in Magnesite Mine Cave-in

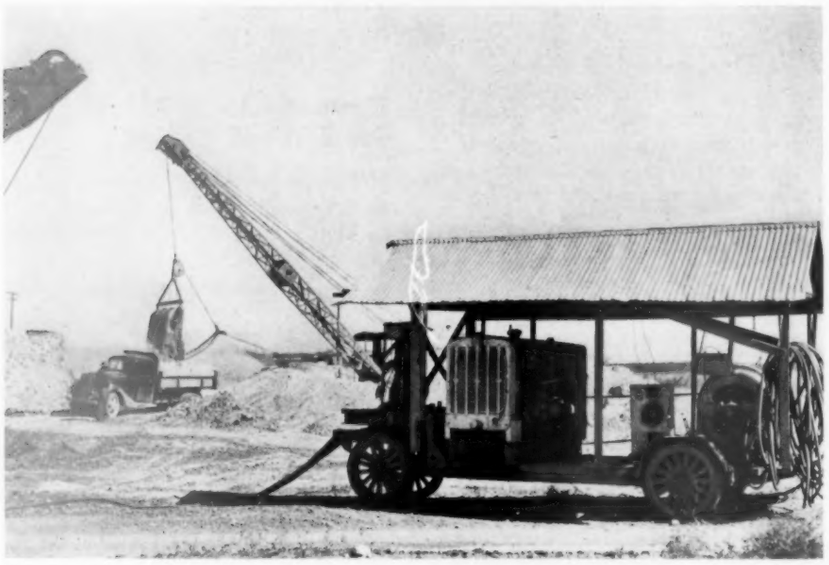
Two men were killed and 80 others escaped in a cave-in at the Red Mountain magnesite mine at Ingomar, California, operated by the Westvaco Chlorine Products Company, recently.

The dead were William E. Maple and Francis Eochin, both of Livermore, California.

## A Diesel-Powered Gravel Plant in Texas



The Fordyce Gravel Company of Pharr, Texas, operates four or five plants in that area of Texas, producing sand, gravel and crushed gravel. Pictured here is the Sullivan City operation where the Caterpillar Diesel engine in the generator house at the right drives a 100 kv.-a. generator to supply power for all processing equipment. Operating 10 hours daily on about 5 gallons of 4-cent fuel per hour, annual savings over purchased power have been estimated at 65 per cent.



Power for the 1¼-cubic yard electric excavator shown loading the truck is supplied by this portable Caterpillar Diesel-generator unit. The shovel ordinarily handles 120 cubic yards per hour, the Diesel consuming about 3 gallons of fuel per hour. Operations of the Fordyce concern are directed by Roger W. Spaulding, general superintendent and chief engineer. R. W. Briggs is president; R. H. Klossner is secretary-treasurer.

## Exemption Sought for Gravel-Dredge Workers

The National Sand & Gravel Association is continuing its efforts to have dredge workers exempted from the Wage and Hour Law under the clause that exempts seamen. The most recent action was a hearing before Administrator Fleming at Washington on March 27. The following committee represented dredge employers in the sand-and-gravel industry: Norman R. Halliday, H. H. Halliday Sand Company, Cairo, Illinois; C. C. Slider, E. T. Slider, Inc., New Albany, Indiana; Ray V. Warren, Western Pennsylvania Sand & Gravel Association, Pittsburgh, Pa.; and Executive Secretary, V. P. Ahearn.

A ruling in the controversy is expected shortly.

## Lone Star Earnings Up Sharply in 1939

### $1,251,216 SPENT ON PLANTS

Operations for the year 1939 by The Lone Star Cement Corporation resulted in a consolidated net profit of $3,561,093.79 as compared with $2,901,784.35 for the year 1938, (with provision for depreciation and depletion). Foreign earnings were lower in 1939 than in 1918 due to some extent to a drop in the foreign exchange rates.

During the year four quarterly dividends of 75 cents per share and a year-end dividend of 25 cents per share, amounting in the aggregate to $3,137,014.00 were paid, or $3.25 per share on the shares outstanding.

Additions to plant and properties in 1939 totaled $1,251,216.78. This sum included the purchase of two new electric shovels (one for New York and one for Cuba), modern unit-pulverizers for handling coal at Greencastle, Indiana and Spocari, Alabama, and additional cement silos at New Orleans. Capital expenditures totaling $1,856,650 have been authorized for additions and improvements to plants during 1940. Of this amount, $876,000 has been authorized for the Hudson, New York, plant, including the construction of modern silos for cement storage and a new shipping plant.

## $200,000 Fire Damages Newark Plaster Plant

Damage unofficially estimated at $200,000 was caused by a fire March 28 which destroyed the huge plant of the Newark Plaster Company at Clifton, New Jersey.

Besides the main one-story building, several small yard buildings, five trucks, two freight cars and all of the company's machinery, much of which was recently installed, were destroyed by the flames. Company records were saved by the office manager, Grant Wileman.

The Newark Plaster Company, which also has plants at Newark and South Kearny, only recently obtained the Clifton plant, which formerly was occupied by the Kelley Plasterboard Company.

### EMPLOYMENT AND PAY-ROLLS

(Compiled for PIT AND QUARRY by Isador Lubin, Commissioner of Labor Statistics, U. S. Dept. of Labor.)

| Industry | Establishments | Number of Employees | Pay Rolls (1 week) |
|---|---|---|---|
| **Cement:** | | | |
| January, 1940 | 135 | 17,311 | $429,884 |
| February, 1940 | 135 | 16,626 | 409,517 |
| Percentage change | | —4.0 | —4.7 |
| **Quarrying and non-metallic mining:** | | | |
| January, 1940 | 1,056 | 29,537 | 575,942 |
| February, 1940 | 1,056 | 29,950 | 599,747 |
| Percentage change | | +1.4 | +4.1 |

## U. S. Opens Quiz on Gypsum "Monopoly"

### BROAD INVESTIGATION IS SEEN

The Federal government has dusted off the 50-year-old Sherman Anti-Trust Act and put it to work in an inquiry into an alleged monopoly of the gypsum industry.

What the anti-trust division of the Department of Justice is attempting to prove is that a handful of companies, including the "big three," have managed to get hold of the principal supplies of raw materials, and are succeeding in building up a monopolistic control over manufacturing methods and patents.

The anti-trust division frowns on this development—largely a trend in the last ten years—because it contends that growth of big companies has tended to break down free economy in the building industry. The implication is that the industry has not passed on to the home builders a large enough portion of the savings secured through technological progress.

The big gypsum companies, of course, will hasten to marshal arguments to disprove this thesis. They are prepared to contend that quite the reverse is true; that the gypsum industry, by developing new processes and advancing technologically, has made possible the widespread use of gypsum products that otherwise would not have been possible.

The statisticians and experts probably will have much to say on the question of an open, competitive price market for consumers, and whether prices on finished products sold for building are out of line with the costs of manufacture and distribution.

As a phase of the gypsum inquiry, the anti-trust division already has filed charges against ten major companies in the composition board industry charging a conspiracy to monopolize and retain trade in hardboard. The government says that "hardboard" is produced under patents held by the Masonite Corporation and that other companies which are potential competitors sold the hardboard acting as so-called "agents" at prices on and terms fixed by the Masonite Corporation. The other companies, the Department of Justice contends, agreed not to manufacture hardboard in competition. The companies involved say that such agency contracts are recognized as being legal and have been upheld in certain court cases.

The gypsum industry, in which the broader inquiry is being made, is a $30,000,000 to $40,000,000 industry. The United States Gypsum Company does about half the business in the country; and the National Gypsum Company with headquarters in Buffalo, about 20 per cent. Together with Certain-Teed Products Company, these companies are said by the government to make about 90 per cent. of all plasterboard and about 80 per cent. of all gypsum products used in the building industry.

**Operation of the world's longest belt-conveyor, manufactured by the Goodyear Tire & Rubber Company for the Columbia Construction Company, Inc., to carry aggregate from its Redding, California, gravel pits to Shasta Dam at Coram (distance 9.6 miles) began in April. Twice as long as the largest belt system ever built previously, it will operate at a speed of 550 feet per minute crossing the Sacramento River at two points and passing over six highways, four creeks and the main line of the Southern Pacific Railroad. The capacity load of the system is 1,100 tons an hour. The belt, 36 inches wide, weighs approximately one and a half million pounds, and will carry 10,000,000 tons of aggregate for the dam over a four-year period.**

## Rock-Wool Warehouse, Plant Gutted by Fire

Fire of undetermined origin caused about $15,000 damage at the plant and warehouse of the Standard Rock Wool Company at Yorktown, Indiana, on March 30. Fortunately, the machinery and equipment suffered little damage and operations are being resumed.

Harlan M. Shirey is president and general manager of the concern.

# CURRENT BUSINESS INDICATORS

Continuation of the downward trend of steel production and a considerable decrease in textile output were the principal factors influencing the further drop of industrial activity in March. The index of the Federal Reserve Board, adjusted for seasonal variation, dropped from 109 in February to 103 in March. Although business conditions in general were somewhat improved during the first three weeks in April a further slight drop in the index seems certain, but the behavior of related indexes that are compiled on a weekly basis indicates that it probably will remain above 100.

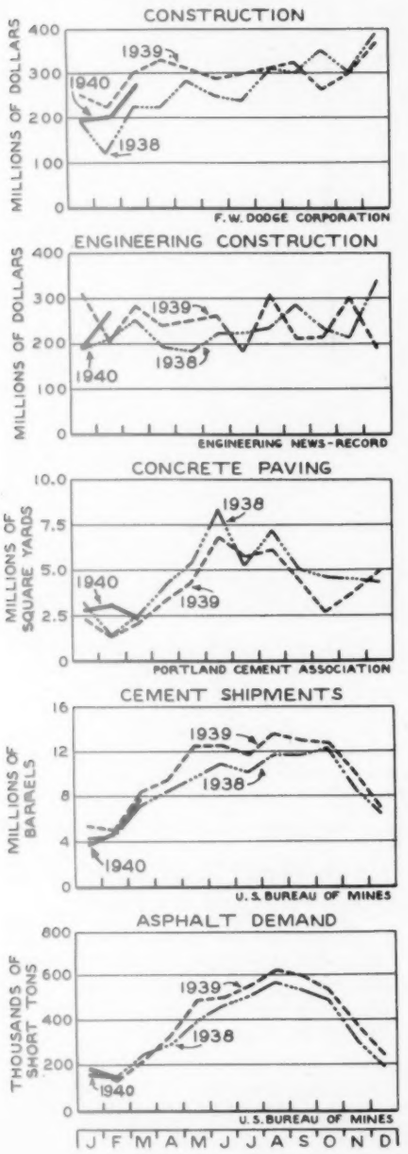
Although the value of construction contracts awarded, as reported by the F. W. Dodge Corporation, increased considerably in March, the advance was entirely seasonal. Awards in the first quarter of 1940 were 13 per cent. below the comparable period of 1939. This decrease, for the most part, represents reduced expenditure of public funds for construction, for privately-financed work was of about the same magnitude as in the previous year.

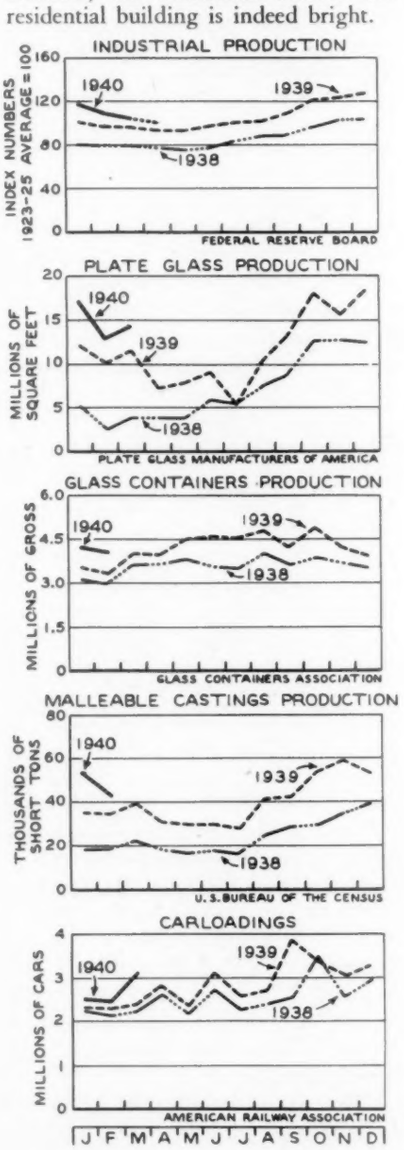
Ever since the early years of the depression there have repeatedly been predictions that a "boom" in residential construction would lead the way to sound economic recovery. Apparently a mild "boom" actually has materialized in some sections of the country during the past several months. The Department of Labor in a recently-issued report on 1939 building operations stated that residential construction during the year not only was a third greater than in 1938 but also represented the highest dollar volume of any year since 1929. The department reported further a gain of 20 per cent. over 1938 in all types of construction, which included, in addition to residential, an advance of 7 per cent. in non-residential building and 9 per cent. in expenditures for additions, alterations, and repairs to old structures.

The Department of Labor reported total building operations in 1939 valued at $2,139,000,000. This figure compares with $3,550,000,000 reported by the F. W. Dodge Corporation for all types of construction but limited to the 37 states east of the Rocky Mountains. Permit valuations for residential construction, according to the department, totaled $1,169,000,000, or 55 per cent. of the entire amount for building. Non-residential accounted for 29 per cent. and modernization the remaining 16 per cent.

New York City, as may be expected, led the nation in total building in 1939, with Los Angeles second but only slightly ahead of Washington. In relation to population the Pacific Coast states showed the highest expenditure of any section of the country with a per-capita outlay of $59.53. The lowest per-capita expenditure was in New England with $23.72 for all types of construction. Generally, small towns had a higher per-capita expenditure than large cities although the lowest was in cities from 50,000 to 100,000 with a rate of $30.99. The number of dwelling units provided per 10,000 population in all reporting cities was 51.

Although residential construction in the first quarter of 1940 was 4 per cent. below 1939, according to the F. W. Dodge Corporation, the Federal Housing Administration has reported evidence of a coming home-building "boom" that may set a 12-year record. All records for F.H.A. home financing were broken for the fourth successive time during the week ended April 13, when actual construction was started on 3,700 new units under F.H.A. inspection. During this same week applications for F.H.A. mortgage insurance on new homes exceeded 5,000, breaking past records for the seventh successive week. Mortgages selected for appraisal reached a peak of 6,647, totaling $29,978,000. How much of this increased activity may reflect greater appreciation among home builders of F.H.A. benefits is difficult to evaluate but, nevertheless, the immediate outlook for residential building is indeed bright.



# EDITORIAL

## *Business* Has *Friends*

FROM the increasingly frequent utterances of certain types of business men, directed at the activities of those who are working in the interests of consumers, it is easy to get the impression that business men generally look upon the so-called "consumer movement" with fear and trembling. The Second National Conference on Consumer Education, sponsored by the Institute for Consumer Education and held last month at Stephens College, Columbia, Missouri, did not dispel the current illusion that the interests of business and of consumers, although dissimilar and in many respects opposed, can not be harmonized. The attitude of numerous self-appointed spokesmen for business has pointed definitely in the direction of the belief that all those who criticize business policies, particularly as these are made evident to the public through the instrument of advertising, are the enemies of business, not its friends. Consequently, there have been many pleas for a better understanding of the objectives of business enterprise, attempts to win public favor by pointing out the material advantages which have come to us through the development of business. Conspicuously absent have been attempts to meet the issues raised by consumers, especially in so far as these relate to fraudulent advertising, false labeling, misrepresentation in selling.

In common with some other business men, we hold the view that those persons, who have been called "detractors of business" by G. H. Dennison of the Better Business Bureau (quoted on this page last month) and others, are in many respects truer friends of business than most of the best known spokesmen for business. They serve the long-run best interests of business in general when they expose and condemn those practices which run counter to the interests of the consumer and which often damage the legitimate interests of competing business men as well. They are, in fact, extending and giving practical effect to the very policies of right dealing which organizations such as the Better Business Bureaus loudly proclaim as the ultimate objectives of their work.

When Stuart Chase and F. J. Schlink published *Your Money's Worth* in 1927 they performed a useful service for honest business. Within the first four years after its appearance it was reprinted thirteen times, so great was the public's interest in the subject matter. A similarly valuable service to honest business men was rendered in 1933, when Arthur Kallet and F. J. Schlink published their *100,000,000 Guinea Pigs,* which in two years was reprinted twenty-nine times. A year later M. C. Phillips wrote *Skin Deep,* which rendered a service to the honest men engaged in the cosmetic industry. In 1936 *Facts and Frauds in Woman's Hygiene,* the work of Rachel L. Palmer and Dr. Sarah K. Greenberg, spread much needed education among women and at the same time protected the interests of those manufacturers who were conscientiously trying to produce and sell useful products for women's use. From J. B. Matthews and R. E. Shallcross came *Partners in Plunder,* which criticised government for its indifference to the interests of consumers, and in 1936 also *Guinea Pigs No More,* a discussion of the possibilities and accomplishments of consumer coöperation by J. B. Matthews.

In our judgment it is imprudent on the part of honest business men to try to nullify the value of such works as factual evidence by accusing their authors of being "guilty . . . of much greater misrepresentation than the very business they accuse," as did Mr. Dennison mentioned above. We deem it equally futile to attempt to divert the attention of consumers from the behavior of dishonest business men to the conduct of honest business men by motion-picture presentation of the greatness of America, the wonders of machine industry, and similar artifices. The adoption of such methods places a very low estimate on the intelligence of most buyers, who, however gullible they may once have been, are now much better informed than they ever were and who are learning more each day. It is unwise to try to belittle the consumer movement because some of its leaders are university professors who "don't understand business" and club women who are "seeking emotional compensations for the dullness of middle age." Many of these despised academicians know business very well; they understand its objectives, its problems, its limitations, its ambitions quite as well as they know its errors, its bad judgments, its mistakes. They know the differences between honest business and dishonest business and it is because of that knowledge that they serve well those business men who have ethical standards and ideals. As for the club women, they at least are free from the commercial influences that might be said to motivate some other critics of unethical commercial practices.

"Business needs friends," said the same Mr. Dennison, addressing a Rotary Club not long ago. Business *has* friends, say we; better friends outside business than inside. Friends we call them because they work in the interest of honest business as well as in that of consumers, because their activities operate, whether they intend it or not, in the direction of the long-run improvement of all legitimate business. Their work may, indeed, save business from the destructive aims of those who, rather than see business made cleaner and therefore more secure, would encourage it to fall lower and lower to its ultimate doom.

The many self-appointed "defenders of business," who fill the air and the columns of the press with their condemnations of those earnest and useful critics of dishonest business practices, have acquired bad habits. They have adopted the false basis of assuming that the attacks of the critics, which are aimed at the methods of dishonest business, are in reality assaults on business as a whole. When they call such critics "detractors of business" they try to make a service that is useful to society and business appear to be an attack on the institution of free enterprise. This is not only dishonest pleading but it opens the way for the drawing of dangerous conclusions. If an attack on dishonest business is an attack on all business, then all business must be dishonest. Certainly that is the only conclusion that can be logically deduced, if the basic argument of these special pleaders is sound. Do these men serve the interests of honest business, we ask, when they base their claims to public favor, to public good-will, on a premise so false? May not they be the enemies of business, rather than its friends?

By W. E. TRAUFFER

# Processing Tennessee Phosphate Rock at Monsanto's Plant Near Columbia

The walking drag-line loading matrix into one of the haulage units.

LATE in 1937 the Monsanto Chemical Company at St. Louis, Missouri, put in operation at Monsanto, Tennessee, 9 miles northwest of Columbia, the first large-scale electric-furnace plant for the manufacture of phosphorus. Although this method had been used on a small scale for years there were many reasons why large-scale production was never before attempted. With an ample supply of raw material, power, and the advanced methods and structural materials used in this plant, previous handicaps were overcome. As a reward for an outstanding engineering achievement this plant, after it was completed, received the biennial award of the chemical industry.

For many years the production of phosphoric acid was confined to the wet method but the resulting acid was too low in strength and too high in impurities for effective use in foodgrade products. Electric-furnace methods were experimented with as early as 1890 but production was limited.

In the years during and after the World War the electric-furnace production of phosphoric acid received a new impetus and the Swann Chemical Company, then known as the Southern Manganese Corporation, began the first production on a commercial scale at its Anniston, Alabama, plant, using phosphate rock shipped from Tennessee. Even in this plant it was at first only a by-product of ferro-phosphorus manufacture.

This operation demonstrated that electric-furnace phosphoric acid was superior to that made by the wet process. In 1935 the Swann Corporation and the Monsanto Chemical Company were merged and the new plant is the culmination of this union.

The furnaces at this new plant were intended to produce phosphorus instead of phosphoric acid, calling for a design

The drag-line walking to a new position.

different from the Anniston furnaces which are no longer used. Also, because they are considerably larger than any other electric furnaces previously built for the production of either phosphorus or phosphoric acid, much pioneering work was necessary in their design, construction and operation. A new process was developed to convert the raw material into a form suitable for use in these furnaces.

The new Monsanto plant takes the crude phosphate materials and extracts from them the highest degree of concentration and purity of phosphorus. The mining, washing and sintering processes prepare the raw material for the furnaces by taking the highly-variable raw material and converting it into one of the maximum attainable degree of constancy for use by the furnace in the extraction of phosphorus. A large part of the output is shipped to the Anniston plant, where it is converted into phosphoric acid. Most of the acid is used in making phosphatic salts which are subsequently used in the making of food products and detergents, in water conditioning, etc.

The phosphate deposits in this area are in the Trenton Group of the Ordovician period of the Paleozoic Era. They are derived almost entirely from the Bigby limestone, which is the second in order from the top in this section. It is a generally-accepted theory that these deposits were a secondary deposition in shallow seas of the Ordovician period and in some manner later became crystallized into the hard Bigby limestone. They were subsequently covered to a depth of several thousands feet and were later again exposed by ages of erosion. The calcium carbonate in these deposits was then leached away by rain water and organic acids, leaving only the residual fossiliferous

A view showing part of the processing plant.

phosphate rock and some of the limestone.

The phosphate rock occurs in the limestone in small pockets or beds which are irregular in occurrence, shape and size. This condition makes it necessary to use open-cut mining to remove the phosphate without contamination from the surrounding limestone, which is valueless as a phosphatic raw material. The overburden consists of from 3 to 25 feet of soil under which is 20 to 50 feet of phosphate rock.

An electric walking drag-line, with a 105-foot boom and a 5-cubic yard bucket, is used for stripping and digging. The overburden is overcast back into the worked-out section of the pit and this is usually done during waiting periods. A drag-line, with a 55-foot boom and a 1½-cubic yard bucket, is also used, principally for cleaning out the pockets after the large machine has done its work. A power-operated clam-shell bucket is used to clean out the least accessible pockets.

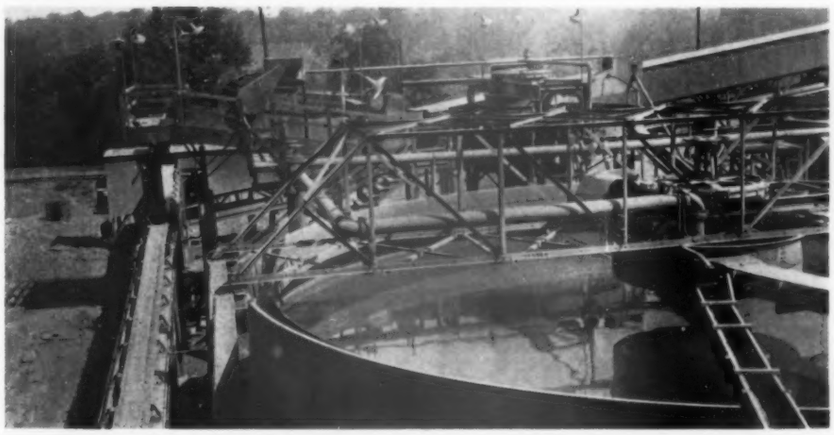
The matrix is loaded by the drag-line into three tractor-trucks, each consisting of a tractor pulling a 12-cubic yard, 2-wheeled trailer. Two of these tractors were originally gasoline-powered and the other had a Diesel engine. The other two now also have Diesel engines. All this equipment is mounted on pneumatic tires. A description of this equipment and the hauling methods used was published in the March, 1937, issue of Pit and Quarry.

The 5-cubic yard drag-line bucket loading one of the tractor trucks.

The matrix containing the highest percentage of bone phosphate of lime is hauled direct to the crushing plant. The lower grade matrix, containing clay and rock, goes to the washer. Both grades are stock-piled separately by these tractor-trailers. A crawler-type tractor with a bulldozer is used to level off the piles. This equipment is also used to feed from these stock-piles to the plant hoppers and to push into the hoppers the material dumped from the trucks.

The high-grade matrix for the crushing plant is dumped through a grating into a concrete hopper. Two bladed agitator shafts break the lumps and discharge them from the hopper on the first of two inclined belt-conveyors running to a 42-inch by 18-inch combination hammer-and-roll pulverizer which was specially designed for this job. The mill product, consisting of ¼-inch-minus material, is carried on a conveyor direct to the muck-storage building.

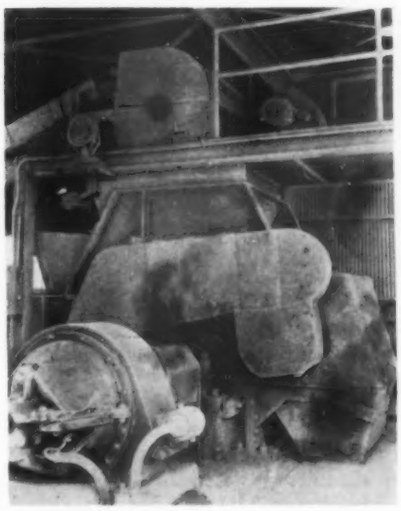
The lower-grade material for the wet plant is discharged to a stock-pile from which it is reclaimed by a 2½-cubic yard bucket scraper. It is then broken up by powerful water sprays in a hopper from which a drag-conveyor carries it to the first of two log-washers. The product of the second log-washer is discharged through a vibrating screen into a 25-foot primary rake classifier. This screen scalps out rock which is crushed by a single-roll crusher from which it goes on a belt-conveyor to the sand storage. The overflow from the classifier goes to a 50-foot thickener and that from the thickener goes to a 12-inch centrifugal sand pump which transfers it to a standpipe from which it flows by gravity into a settling pond to be used again.



Thickener in the wet department, with bowl-and-rake classifier in background.

The product, or mud, from the rake classifier is carried on a belt-conveyor to another section of the muck-storage building. The underflow from the thickener is forced by a 4-inch pump into a 25-foot diameter bowl-and-rake classifier from which it is discharged on the same conveyor. A weigh-meter on this conveyor checks the output of the washer.

The roofed-over storage building has a capacity of about 15,000 tons of sand and muck. Material is stored and reclaimed by an overhead crane with a 3½-cubic yard clam-shell bucket. The matrix and sand or concentrates are mixed in feeding them into two bins over the conveyor running to the sintering department.



The 42- by 18-inch combination hammer- and roll-pulverizer which reduces matrix.

Coke breeze is discharged from a track hopper on a belt-conveyor running to a bucket-elevator from which it can go to storage or be dumped into a bin. Thence it is fed to a rotary drier, and then to a 5- by 10-foot rod-mill which reduces it to ⅛-inch minus and discharges it into a bin.

Under each of these bins is a table-feeder which discharges the materials on the belt-conveyor running to the sintering department. Weight-meters on the matrix and concentrates belts weigh these materials before they are discharged on the belt running to the sintering department. Coke is added from a third conveyor but is not weighed. The sinter fines are added to this mixture on the main belt.

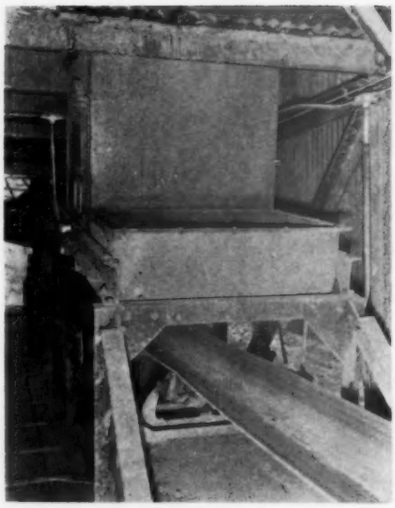
The sintering machine is a continuous traveling grate with an air draft down through the material on the grate. Fuel-oil burners ignite the coke in the material so that it burns progressively from the top down. The fuel is thus progressively consumed with a

One of the continuous-weighing automatic scales feeding the conveyor to the furnace plant.

resulting fusing together of the non-volatile particles. By this means a light-weight porous furnace charge, which contains all the necessary ingredients except the coke, is obtained. A swinging conveyor distributes the mixture in an even bed across the 6-foot width of the grate.

The sintered material is discharged from this machine into a storage building, wherein an overhead crane with a 3-cubic yard clam-shell bucket feeds it to a hopper. A pan-conveyor carries it from the hopper to a double-roll crusher. A grizzly splits this material into coarse and fine fractions which are carried by separate elevators to two 2-deck vibrating screens.

The oversize material from the coarse screen is chuted back to the double-roll crusher already described. The material retained on the bottom deck is finished product and is carried back on a belt-conveyor into a separate section of the



Automatic scale which weighs the material being carried on conveyor from washer.

last-mentioned storage building or into a bin for loading cars for shipment. The overhead crane transfers the stored material to a bin over the belt-conveyor running to the furnace plant. The fine material coming from this screen is carried by a screw-conveyor back into the section of the storage used for the raw matrix.

The next screen receives the material passing through the grizzly. The material retained on both decks is product and goes on the above-mentioned product conveyor to storage. The material passing through the bottom deck drops into a bin feeding the conveyor leading to the sintering department.

As a result of this sizing the sinter is made to approximate the size of the coke used. Since it has about the same size and porosity as the coke it will descend in the furnace at substantially the same rate and thereby prevent segregation. During the sintering operation, also, any undesirable impurities are either eliminated or decreased.

Coke is conveyed from the muck bin by a belt into a second bin. Silica is elevated into a third bin over the conveyor running to the furnace plant. Under each of the three bins is a continuous-weighing automatic scale. These scales proportion the sinter, silica and coke on the conveyor leading to the furnace plant.

While the actual manufacture of the phosphorus is a chemical operation, a

Swinging feed conveyor above the continuous traveling-grate sintering machine.

brief description is given for those readers interested in this department. Three electric-arc furnaces are employed, each using 10,000 kilowatts of electrical energy which is passed through carbon electrodes. The sintered phosphate and the coke are mixed together and fed into these furnaces. In the furnaces the phosphorus is volatized and the silica and the lime of the phosphate rock combine to form a slag. The iron present as an impurity combines with a portion of the phosphorus to form ferro-phosphorus and this is withdrawn intermittently with the slag

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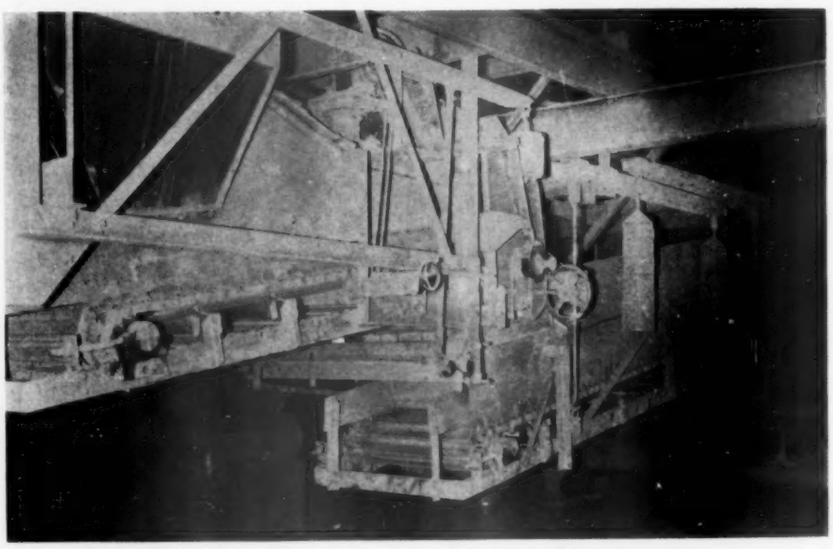


Another view of one of the three continuous-weighing automatic scales.

# SELECTING THE RIGHT ROPE

**By F. L. SPANGLER**

**Wire rope combines certain qualities that are found in like degree in no other type of construction. This article describes how these qualities are developed in rope, and gives aids on selecting rope with the view of deriving full benefit from these desirable traits.**

HIGH strength, flexibility, and elasticity are the particular characteristics that make wire rope indispensable in quarrying and other industries. A wire rope has a breaking strength about double that of an annealed-steel rod of similar metallic cross-sectional area and chemical composition. The higher strength of rope results from the cold work and heat-treatment given the individual wires. Also, the wire rope is twice as elastic as the rod, since the modulus of elasticity of a 6 by 19 hemp-center rope is 13,000,000 to 15,000,000 compared to 30,000,000 for solid steel.

The advantages of wire rope have been recognized for at least 2,400 years. The oldest known specimen of wire rope had its origin while Pompeii was a thriving city. In those days wires for ropes were beaten out by hand, and it was not until the 14th century that wire was first made by machine. The manufacture of rope from wire remained a hand operation for several centuries longer, and it was not until 1846 that the first machine-made wire rope was placed at the service of American industry.

Though improvements in wire metallurgy took place from time to time, no outstanding development occurred in wire-rope manufacture until 1924, when preformed rope was introduced. In preformed rope the strands, instead of being forcefully closed on the rope core, are preformed to their final shape before the closing operation and, hence, they lie dormant in the completed rope.

A wire rope is made up of wire strands closed on a center, or core, in such a fashion that each strand is a continuous spiral. The strands are formed from a number of wires, each of which is spiraled around a central or king wire. Hence, in the completed rope, each of the outer, or crown, wires assumes a shape known as a "helix within a helix".

Prior to the introduction of preformed rope all machine-made wire rope was made by pulling the wire strands through a closing die, the effect of which was to force the strands out of their natural straight position and to introduce locked-up stresses in the wires. When such a rope is severed, these forces are released, causing the ends of the individual wires and strands to straighten out with such force that the severed ends of the rope virtually "explode" and ravel for a considerable distance. To hold the wires in position it is necessary to bind the ends of the rope with seizings. With preformed rope seizings are not necessary, though they may be used to prevent accidental dislocation of the strands while handling the rope.

It is the spiral formation of the strands and wires that enables ropes to operate with considerable freedom over sheaves and drums. As an element of rope passes on or off a sheave, the rope at that point undergoes a change in flexure, thus producing a corresponding change in the stresses in the wires at that point. As a result, the wires and strands slide slightly over one another, thereby equalizing to some extent the variations in stresses. The ease with which the various wires can make this adjustment depends on their freedom of movement. This is influenced to some extent by the lubrication of the rope and to a greater extent by the gripping action of the wires and strands on one another. The more the individual wires are restrained in their movement, the more unbalanced become the forces in the rope, under which condition the load is not equitably distributed among the individual wires.

To reduce internal friction, as well as to prevent corrosion, ropes are supplied with lubricant during the process of manufacture. Not only are the individual wires coated with the proper grade of lubricant, but the hemp core is saturated with lubricant, thereby providing a reservoir sufficient to keep the rope lubricated during the early stage of its use. By reducing friction proper lubrication aids the readjustment of the wires and strands to provide uniform loading when the rope passes over drums and sheaves.

Resistance to movement of the individual wires in a rope is more noticeable in the case of non-preformed ropes than with preformed ropes. The internal stresses locked up in non-preformed rope in the process of manufacture impose restrictions on the wires and strands, which tend to prevent their free movement, whereas the wires and strands of preformed rope are in a "state of ease", in which no internal stresses are present.

Also, the type of rope construction has an influence on the extent to which the wires must move to compensate for an unbalanced loading condition when operating over sheaves and drums. The unbalancing of the load is less with Lang-lay rope than with regular-lay rope, which is explained by the position of the crown wires in both types of ropes. In Lang-lay rope the wires in the strands and the strands in the rope are both spiraled in the same direction, whereas in regular-lay rope the strands are spiraled in the opposite direction from the wires in the strands. A common helix angle for both wires and strands is about 18½ degrees. The angle which the crown wires in a Lang-lay rope make with the rope axis is obtained by adding the helix angle of the strand wires to the helix angle of the strands, while in a regular-lay rope this angle is the difference between the two helix angles. Hence, if both helix angles are 18½ degrees, the angle of lay of the crown wires of Lang-lay ropes is 37 degrees, while for regular-lay ropes it is zero.

Since the crown wires of Lang-lay ropes lie crosswise to the rope axis (making an angle of 37 degrees to the axis), a given strain in the direction of the axis results in less stress than where the crown wires are parallel to the strain, as in the case of regular-lay ropes.

The position of the crown wires of Lang-lay rope also adds to the flexibility of that type of rope. Flexibility is also influenced by the size of the wires. The smaller the wires, the more flexible the rope becomes, since it takes less effort to bend small wires, even though many in number, than to bend large wires. Where the strand construction is the same, the greater the number of strands in a rope, the smaller must be the wires and, hence, the greater the flexibility. Eight-strand ropes, therefore, are more flexible than 6-strand ropes of the same diameter.

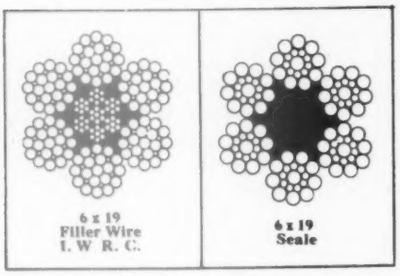
The high factor of safety that must be provided for when selecting a rope is

**A section of 6 by 19 preformed rope with independent wire-rope center cut apart to show construction. It would be impossible to cut non-preformed rope in this manner because, upon cutting, it would fly apart due to the locked-in stresses and unrelieved strain.**

sufficient to prevent sudden failure when restrictions to movements of individual wires result in non-uniform loading. Unequal loading, nevertheless, is very harmful in that it promotes metallic fatigue, which leads to progressive failure of the individual wires and eventual destruction of the rope.

Fatigue is characterized by minute cracks, usually appearing in the crown wires. After a time these cracks spread through the crown wires, causing the wires to break. In a fatigue break the ends of the wire do not show the "necking down" that characterizes a tensile break.

It has been definitely established that fatigue is caused by recurrent stressing




By the use of limber, flexible preformed rope it is frequently possible to employ a more rugged construction—6 by 19 Seale as opposed to 6 by 19 filler wire, for instance.

of the wires, which occurs when the rope passes on and off sheaves and drums, or when vibrations are set up in the rope. Either of these conditions produces alternate flexing of the rope, thereby introducing bending stresses in the individual wires.

If the rope is loaded, and if it also has internal stresses introduced in the wires in the manufacturing operation, the sum total of all these stresses may be quite large, though never will it exceed the ultimate strength of the wires. The larger this total stress, the sooner will fatigue appear. Also, fatigue is accelerated by the frequency with which these stresses occur.

Fatigue is especially likely to appear in ropes operating continuously over small sheaves and drums, where bending stresses are high, and in installations where vibrations are set up in the rope. Vibrations provide a periodic impulse of high frequency that often produces highly-concentrated stresses at the point where the rope enters a socket or at clip attachments. Fatigue is apt to be particularly severe where sockets or clips are installed without due regard to maintaining the true lay of the rope or without careful attention to preventing damage to the rope.

Where the nature of the service is such that fatigue is a serious factor, rope life may be increased by using preformed rope, since the absence of internal stresses in performed rope, together with the comparative ease with which preformed rope adjusts itself to equalize rope loads, results in a marked reduction in the total stress in the wires.

In addition to fatigue another destructive influence to ropes is abrasion, particularly on drag-cables, inclines, and certain other applications. Since abrasion affects only the crown wires of the rope, these wires are the principal ones to be considered in selecting a rope to meet abrasive conditions.

It is apparent that large crown wires will withstand more wear than small wires. The most popular ropes for abrasive conditions, therefore, are of Seale construction, since a 19-wire Seale strand has only 9 crown wires, all being of comparatively large diameter. Since preformed rope is more flexible and possesses greater fatigue resistance than non-preformed, the use of preformed frequently allows the adoption of a more rugged construction of rope—one that will withstand abrasion better —and in nonmetallic-mineral service abrasion is often a serious factor. Where the rope does not operate over sheaves or drums, except of very large diameter, the 7-wire strand rope may be used, thereby providing even larger crown wires than in the 19-wire Seale strand.

The spiral formation of strands and wires in rope, in addition to contributing to freedom of operation over sheaves, also gives the ropes elasticity, which is the property of absorbing shocks without permanent injury. When a rope is loaded, the strands tend to constrict and to move inward, compacting themselves on the hemp center. Both these effects result in a stretching of the rope, this being especially noticeable when the rope is new. This stretch, known as constructional stretch, relieves the shock when a load is suddenly applied to the rope. After a short time, a considerable part of this stretch becomes permanent, and it may become necessary to take up part of the rope or cut a short length off one end to compensate for the stretch.

Some rope constructions retain their shape and resist crushing better than others. This quality should be considered in those installations where the rope may be subjected to crushing action, such as when operating below recommended factors of safety or when being spooled in more than one layer. Lang-lay hemp-center ropes do not resist crushing as well as regular-lay ropes. Also, 6-strand ropes resist crushing forces better than 8-strand ropes with their larger hemp centers. In any rope construction resistance to crushing can be increased by using an independent wire-rope center instead of a hemp center.

Satisfactory performance of wire rope requires that selection be made with due regard for the service expected. It is necessary that the rope fit the service, if one is to realize fully the benefits of high strength, flexibility, and elasticity that characterize wire rope.

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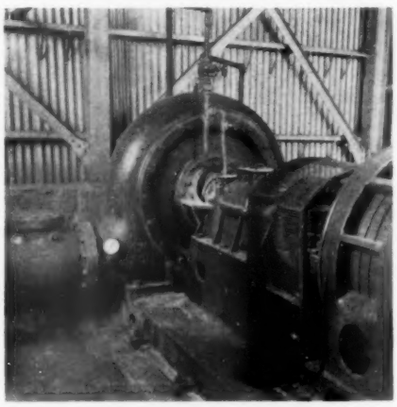
## Monsanto (from page 26)

in molten form, into slag ponds where the ferro-phosphorus is separated and sold to the steel industry. The carbon-monoxide gas is safely burned.

The phosphorus vapors are conducted by vents to condensing units, wherein



The 12-inch pump which sends classifier and thickener overflow to waste.

the gas becomes a liquid and is collected under water in sumps. The phosphorus is kept in storage tanks from which it is loaded into tank cars. In these cars

The second of the two log-washers in the wet department.

the unfilled space in the dome is filled with water to protect this temperamental chemical from the air.

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The Edison silica mines, located near Edison, Nebraska, have been opened after remaining inactive for several years. The first car of silica to be loaded was shipped to Chicago, and a number of orders are waiting to be filled, it was announced.

# Enterprising Virginia Operator Builds Profitable Business

**By HENRY LOCKHART III**

THE Norfolk Supply Company, located at Onley on Virginia's eastern shore, is an example of the kind of business which can be developed by an enterprising operator in a small rural community. For washed sand orders Parker F. Norfolk, the owner, depends almost entirely on state road and W.P.A. work, as there is little local building. His sales of building units and material are confined chiefly to the construction of schools and public buildings, while a limited number are used in factories, canning plants and houses.

In addition to producing washed sand and sand-concrete and cinder-concrete masonry units, this company is also the distributor for many side-lines, such as clay bricks, steel sash, roofing material, cement, lime, crushed stone, washed gravel, and other building supplies. Another profitable side-line is the renting of contractors' equipment, such as concrete mixers, pumps, pile-drivers, artesian well rigs, and conveyors.

Mr. Norfolk is also able to do all his repair work as he does electric welding and iron work, and fabricates pieces of equipment from time to time. A 23-foot belt-conveyor, a small vibrating screen for testing sand, a sand-settling box of his own design, and other features of the sand plant testify to Mr. Norfolk's ingenuity and resourcefulness in this direction.

Production at the Accomac site started September, 1939, since when 10,000 tons of sand has been supplied on a state highway project, 500 tons of pea gravel and 500 tons of sand have been sold locally, and a 6,500-ton sand order on a state highway widening job is now being filled. Prior to this a plant was operated at Bird's Nest, Virginia, from November, 1938, to July, 1939.

The deposit is approximately 35 feet deep, and consists chiefly of sand with a small percentage of pea gravel. There is a 3-foot layer of gravel below water-level. The pit is located in wooded land which has to be cleared, 6 feet of overburden being stripped by the ⅜-cubic yard Bucyrus-Erie gasoline shovel. The deposit is then worked out to water level with the shovel, the plan at present being to continue excavating to this depth with the shovel and to dredge 15 feet deeper with a 6-inch suction pump. The material is hauled from the pit to the plant in two dump trucks—one a Chevrolet and the other a Ford with dual rear wheels—which back on a wooden ramp with a 3-foot incline and discharge into a hopper over a 10-foot Telsmith plate-feeder charging the bucket-elevator. The elevator, which has 16-inch buckets, is 48 feet long from center to center and discharges into a water box, where the material is washed. A 4-inch Lightning high-head pump, located on the shore of a mill-pond, supplies water at the rate of 500 gallons per minute.

The washed material is then screened through a vibrating screen—a Telsmith, 3-foot by 8-foot double-deck vibrating unit, the upper deck having ⅝-inch openings and the lower one being a No. 183 or 4-mesh to conform to the Virginia state sand specifications. The oversize, or pea, gravel is crushed by a 16-inch by 16-inch New Holland double-roll crusher, the discharge being fed back to the bucket-elevator by means of a chute and a flight-conveyor. The crusher is used continuously as there is little demand for the pea-gravel size locally. When there is too much oversize for the crusher to handle, the overflow is run into a 60-ton bin of 4- to 8-inch gravel.

The washed and screened sand is discharged from the screen into a 3-foot by 5-foot wooden sand-settling box, where the gradation, as regards the amount of coarse, medium and fines retained, is governed by manually-operated stoppers in 3-inch diameter discharge holes. In this way changes in the nature of the material can be compensated for. The sand as dropped from the box is further washed and dewatered by means of a 12-foot Telsmith screw-washer, the adjustable overflow of which regulates the amount of fines retained. This sand is then discharged into two 60-ton overhead bins.

The dirty water from the settling box and screw-washer is returned to the pond by a 350-foot chute, and gutters and drains carry excess water around the bins away from the plant, providing dry working conditions. All the bins are of the overhead type for truck loading, a full-width cement driveway extending as far as the truck scales in front of the office.

The wet sand from the bins is stocked by a dump truck to a height of 20 feet, the truck being backed up on the pile on wood mats. The dry sand is then loaded in trucks for delivery, a portable belt-conveyor being used for this purpose.

Power for the elevator, vibrating screen, screw-washer, and flight conveyor is supplied by a gasoline engine. Another gasoline engine drives a 5-kilowatt generator furnishing electricity for lights when operating at night.

The plant normally operates with 8 men, but this number will be reduced when a conveyor is used for stock-piling the wet sand, and while the dredge is running. The production is 250 tons in 8 hours.

Mr. Norfolk's first problem was financing the plant, but this was overcome when he was able to buy an elementary set-up from a contractor at half-price after the latter had finished his job. As the deposit is loose many difficulties were avoided. Sufficient water for washing was obtained by dynamiting a ditch from a near mill-pond. To meet rigid state requirements more thorough cleaning was provided by the addition of the screw-washer, and pea-gravel, for which there was little local demand, was disposed of by crushing it to sand size, at an estimated cost of about 1½ cent a ton.

As Mr. Norfolk was not able to buy the deposit outright, he arranged to pay the owner a 5-cent a ton royalty. Other difficulties were taken care of as they came up; as, for instance, when it was found that it was less expensive to stock the sand to dry out than to haul the water in the wet sand as originally loaded direct from the bin.

To make sure that the sand is constantly meeting requirements it is tested

The plant office and scale-house.

The sand-and-gravel plant at Accomac.

not less than three times daily. For this purpose a home-made vibrator is used, driven by a ½-horsepower engine, using Tyler standard screens, the screened material being weighed on torsion-balance scales, after first being heated over a small keresone stove.

The invoice system is also worthy of note as four copies are used. The trucker gets one copy, the customer receives another on delivery, a third is kept for checking and filing, while the original is mailed with the statement at the end of the month. In this way there is a double-check on hauling as well as deliveries.

As stated, the difficulty of working the deposit down to its maximum depth will be met by using a suction dredge for which all the equipment is now on hand. A 3-deck screen will replace the double-leck unit to save the gravel encountered at this lower depth.

Like many other sand-and-gravel operators, Mr. Norfolk has had to learn by experience. The fact that he has profited by his experience in such a comparatively short time is a tribute to his intelligence and hard work. Probably the most significant feature of his plant is the fact that he has been able to work up this business practically on sand only with very little local building to depend on, road maintenance and construction work being the main outlet.

The concrete-block plant at Onancock, also operated by the Norfolk Supply Company, is in a 40-foot by 60-foot frame building, with an adjacent 20-foot by 40-foot cement and lime storage shed. Four-, 6-, 8- and 12-inch by 8-inch by 16-inch concrete masonry units are made on a Multiplex C-1 hand-operated stripper. A production of 500 8- by 8- by 16-inch units or the equivalent is attained when working 4 men. Both sand- and cinder-concrete blocks are manufactured, as well as sand and cinder bricks, which are made on a Multiplex brick machine.

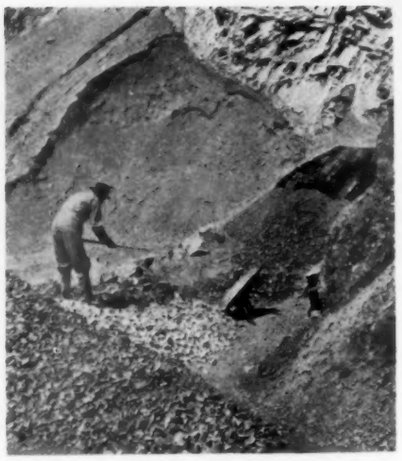
Coarse and fine sand are supplied from the sand-washing plant at Accomac, crushed cinders being trucked from Chester, Pennsylvania, by independent truckers on their return trips. The aggregate is measured into buckets, which are dumped into a tilting hopper attachment on the side of the mixer. The mixer is a 12-cubic foot Multiplex, electrically-driven. A 1-bag mix is used. The full hopper is discharged into the mixer by tilting, and the grout, when ready, is ejected from the mixer into a wood box.

No. 5 scoop shovels are used for filling the block and brick machines from this box. The green blocks are laid on wood racks, holding 72 blocks each, for the initial moist-curing inside the shed. Twenty-foot by 20-foot lined burlap covers are used to preserve the moisture in the blocks, and to protect them from air drafts which would cause them to dry out. When the blocks are ready to be moved, they are transported to the stock-piles over concrete floors and driveways, where they are again covered and sprinkled for several days longer with a Skinner water sprinkler until they have been thoroughly cured.

## Modern Plant Supplants Primitive Native Labor

Rock is generally broken by native hand labor in a quarry near Bogota, Colombia. Each man is paid on a piecework basis according to the number of cubic yards of material that he can produce. At present there are 30 men crushing rock in this quarry by hand.

However, the new road-building program for Colombia requires more material than these men can possibly produce. A new plant is now being furnished to the State of Cundinamarca for



A native "hand operator."

installation in this quarry. It will produce more material in one hour than these 30 men can produce in one day. The results will be more material produced, better roads built, and more work for the laborer.

One such plant, also pictured, and said to be the first modern crushing plant in Colombia, was recently installed near the town of Cucuta in eastern Colombia. This plant is a Pioneer Duplex crushing, screening and loading plant, and is producing base-course and surface-course material for the projected International Highway which will eventually link Caracas, Venezuela, and Bogota, Colombia, with a modern, all-weather highway. The plant is owned and operated by the Compania Constructora de Carreteras of Bogota. By crushing, screening, and removing excess fines, it is giving Colombian aggregate producers and road builders a new conception of speed and capacity that can be appreciated when it is remembered that the hand method shown in the other illustration has always prevailed heretofore.

Pit and Quarry is indebted to the Pioneer Engineering Works of Minneapolis for these illustrations and information.

This portable crushing plant near Bogota, Colombia, produces daily what 200 natives formerly got out with hand tools.

# GEARMOTORS SIMPLIFY DRIVE PROBLEMS

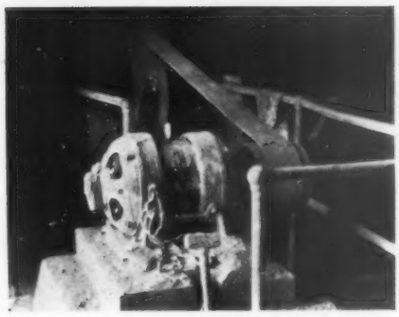


Fig. 1.

Fig. 2.

Fig. 3.

**Here are three ways to drive a conveyor: left, typical low-speed induction motor with belt and gear transmission; center, gearmotor of low output speed driving conveyor through inclosed chain; right, gearmotor with output speed matched to the conveyor head, directly coupled.**


**By M. A. HYDE**

**Westinghouse Electric & Manufacturing Company**


IN plants manufacturing cement and the allied mineral products most of the machinery requires power delivered at relatively low speeds. Not only is this true of most primary operations but practically all the intermediate material-handling equipment, such as conveyors, screens, and elevators, require some form of speed-reducing equipment between the prime mover and the load.

In laying out drives for these auxiliaries it was formerly common practice to select motors having speeds as low as were considered practical, frequently at the expense of motor cost and performance. Starting with a relatively low-speed motor the transmission to load could be effected by belt drive followed by open gears or low-speed chain, according to the needs of the installation. Such an installation is typified by the clinker conveyor drive shown in Fig. 1. In spite of the guard rail this belt drive represents a considerable hazard to the operator's safety. In addition power losses through belt slippage and open gears penalize such a drive from the standpoint of operating cost. Moreover, the series arrangement of mechanical items forming the steps in such a power transmission may be compared to a succession of dissimilar links joined into a chain. The fewer such links, the better from the standpoint of confidence in over-all operating reliability.

Fig. 4.

**This totally inclosed, fan-cooled gearmotor driving belt-conveyor has shown ability to "take it" under severe dust conditions.**

In contrast, the screw conveyor shown in Fig. 2 is driven by a very simple transmission. Here the driving motor and speed reduction are combined in one unit—a gearmotor—and the output shaft of the gearmotor is connected to the conveyor head by an inclosed chain drive. The principal function of the chain drive is to provide a means of changing the over-all ratio to obtain just that conveyor speed shown desirable by experience after making the installation.

If the final conveyor speed can be closely predetermined without the necessity of provision for possible future change, an even simpler arrangement is shown in Fig. 3, where the gearmotor is directly connected to the head shaft of the conveyor. Incidentally, this installation shows strikingly one of the advantages of the gearmotor unit over the combination of separate motor and speed-reducer. This foundation, built of wood, would probably be inadequate for a separate motor and speed-reducer due to the necessity of maintaining close alinement between them. With the gearmotor this problem disappears because it is taken care of once for all in the factory assembly of the unit.

Gearmotors are available in all the usual motor constructions—open, splashproof, totally-inclosed fan-cooled and even explosion-resisting. For locations exposed to extreme dust conditions the totally-inclosed fan-cooled unit provides effective motor ventilation and at the same time protects the windings against the action of abrasive dust. Such an installation is the 3-horsepower gearmotor shown in Fig. 4 driving a cross conveyor from a pulverizer to an elevator. Two 7½-horsepower elevator drives are shown in Fig. 5, using gearmotors of this type.

Space is of primary importance in laying out many drives. On the agitator shown in Fig. 6 minimum space was required by the horizontal gearmotor and bevel gear. In this case there was insufficient head-room to accommodate a vertical gearmotor which would have given an even more compact arrangement.

Fig. 5.

**Gearmotors contribute to the compactness, neatness, and safety of these bucket-elevator drives. All moving parts are protected by metal guards.**

Fig. 6.
A horizontal double-reduction gearmotor was ideally suited to this agitator drive where headroom was limited. Bevel-gear normally covered for safety.

Another instance of the compactness afforded by gearmotor drive is the limestone driver shown in Fig. 7. Here the 50-horsepower unit is mounted in a niche in the foundation supporting the drier, while a canopy protects the motor against weather and the radiant heat from the drier drum. The gearmotor is mounted at a slight angle so that its output shaft is parallel to that of the pinion driving the inclined drier.

The main fine-grinding operations in cement manufacture are generally carried out in large-size compartment mills or in preliminary pulverizers followed

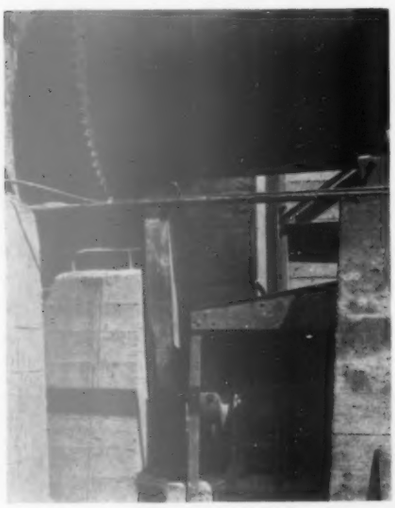


Fig. 7.
Compact drive for a limestone drier is obtained with this 50-horsepower gearmotor.

by tube-mills, which units range in size from 200 to 1,000 horsepower and are excellently suited to driving by low-speed synchronous motors. However, there are occasional installations of smaller grinding units in the cement and allied industries where the compactness and unit construction of the gearmotor have definite advantages. Fig. 8 shows a 100-horsepower unit with open type squirrel-cage motor driving a pulverizer at 374 r.p.m. in a gypsum plant.

The fan operating in connection with this pulverizer is an example of the ability of the gearmotor to satisfy exacting speed requirements. In this case the fan was designed to operate at 1,450 r.p.m. driven by a 25-cycle induction motor, but a power change-over to 60 cycles made 1,750 r.p.m. the nearest available motor speed. It was necessary to retain the original blower speed. The 75-horsepower unit shown in Fig. 9 provided the answer, using a 60-cycle, 1,750-r.p.m. motor with an output speed from the unit of 1,450 r.p.m.

Fig. 8.
A pulverizer drive using 100-horsepower, 374-r.p.m. gearmotor. Space is conserved by arranging output shaft above motor shaft.

As already indicated, gearmotors may be had in any of the commercial forms of motor frame construction from open to explosion-proof. In all these forms tight inclosure and automatic oil lubrication of the gearing parts insure long life and efficient operation. Various types of motors are available, including the general purpose polyphase squirrel-cage motor, the squirrel-cage motor

Fig. 9.
This 75-horsepower gearmotor allows coupled drive to blower at designed blower speed of 1,450 r.p.m. using 60-cycle motor speed of 1,750 r.p.m.

built for low starting current or high starting torque, the wound-rotor induction motor, and even single-phase and direct-current motors where conditions require them.

Ratings range from ¾ to 75 horsepower, using motor speeds of 900, 1,200, or 1,800 r.p.m. and gearing in single-, double-, or triple-reduction forms with standard gear ratios as high as 200 to 1. One manufacturer provides 46 standard gear ratios with each of these speeds, giving output speeds ranging from 4.4 to 1,500 r.p.m.

The gearmotor takes advantage of the higher efficiencies, torques and power factor inherent in high-speed motors, and at the same time provides reduction of the motor speed to practically any required output value. This is accomplished in one unit in contrast to the installation of motor, coupling, and speed-reducer, involving the purchase of these elements separately and their individual mounting and lining up on the job.

An important advantage of the gearmotor is the necessary coördination of motor and gearing parts by the manufacturer, who is singly responsible for the unit. The manufacturer is in an excellent position to fulfill this responsibility, for he can readily provide gearing parts matched to the known torque characteristics of his motors. The user need then only consider the horsepower and speed required at the load and the supply of electric power to the unit.

## Production of Domestic Clays Near Peak Level

Domestic production of high-grade clays in 1939 probably was almost as great as the all-time record output in 1937, according to the Bureau of Mines.

American clays have displaced imported clays for many uses, and recently cheaper coating clays, produced by centrifuging high-grade domestic clays, have competed with the best clays imported from overseas and even with satin white. The last stronghold of English clays has been in making hotel china, certain kinds of sanitary ware, and electrical porcelain. All-American bodies have been developed, even for these wares, but the higher softening point and usually inferior color of domestic clays have delayed their adoption in the manufacture of these relatively high grade products; however, domestic clays have been used to a rapidly increasing extent in the production of sanitary ware, and their increasing use in this field has been accelerated by war conditions, which have virtually cut off supplies from Continental Europe and impeded shipments even from Cornwall.

# PIT AND QUARRY Special

# LIME SECTION

A view in the quarry of the Longview-Saginaw Lime Works at Saginaw, Alabama. A hydraulic-lift truck is dumping stone from a bucket into car for haulage to plant.

# NEWS OF THE LIME INDUSTRY

## Reveal Program Details for N.L.A. Convention

May 21, 22, and 23 are the dates, and the Drake Hotel in Chicago is the place of the twenty-second annual convention of the National Lime Association.

A meeting of the board of directors and executive committee is scheduled for the morning of May 21. An industry luncheon is planned for 12:30 o'clock that day, and the convention will open officially at 2:15 p. m. Followng the usual routine business affairs, the tentative program includes a discussion of the Robinson-Patman Act by William F. Dinnen, in charge of the Chicago office of the Federal Trade Commission; a paper on the stabilization of clay roadbeds with lime by Sherman D. Lesesne of Oklahoma City University; and a discussion on chemical lime by Prof. J. R. Withrow of Ohio State University.

The morning session of Wednesday, May 22 will open with a showing of a sound motion-picture entitled "Your Town—The Story of America", production of the National Association of Manufacturers. Following this, Dr. Charles Copeland Smith, a capable speaker on the staff of the same organization will present a talk on public relations. Arrangements are being completed to include in this session a discussion on labor relations by a recognized authority on the subject. E. L. Nicolson, application engineer of the General Electric Company, will point out the various electrical hazards which are encountered in industrial plants and what can be done to provide safer working conditions. At this time the winners of the 1939 safety competition will be announced.

Tentative plans call for the scheduling of an industry luncheon at 12:30 a'clock on Wednesday, to be accompanied by a speaker on a subject of interest to the industry.

The afternoon session on May 22 will appeal to those interested in operating problems. The subjects lined up for presentation cover the use of pulverized coal for calcining limestone, designs of plants for producing low-cost lime, and X-ray studies of lime with practical conclusions. Speakers will include S. B. Kanowitz, Combustion Engineering Company; Victor Azbe, consulting engineer, and Prof. G. L. Clark, University of Illinois.

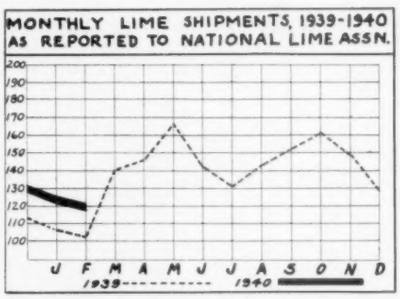
The annual banquet and entertainment will be held at 7:30 p. m. on May 22.

The concluding session of the convention on May 23 will feature as its first item a motion-picture in color entitled "Green Acres", produced by the National Fertilizer Association. This picture is said to give as much credit to lime as to fertilizer for the efficient maintenance of good pasture lands. Dr. Jackson B. Hester, soil technologist of the Campbell Soup Company, will follow the movie with a review of his recent investigations on the use of lime in tomato-growing. Reports on the association's research program at M.I.T. on mortars, masonry, and concrete will be made by Prof. Walter C. Voss and Howard R. Staley of that institution. The session will conclude with the presentation of the annual budget for the new fiscal year, reports of committees, and other matters of business relating to the operation of the association.

## Install New Lime-Putty Plant at Richmond

A standard two-tank Brooks-Taylor lime-putty plant is being installed at Richmond by the Massaponax Sand & Gravel Corporation of Fredericksburg, Virginia.

The tanks each have a capacity of 2,500 cubic feet. An improved screen with 64 openings to the square inch is being installed for screening the slaked material.




According to data collected by the National Lime Association, 74 companies in February, 1940, shipped 117,259 tons (79,181 quicklime; 38,078 hydrate). Reporting companies represent 52.6 per cent. of the association's total capacity of record. Based on PIT AND QUARRY's estimates for the remainder of the industry the total shipments for the month are estimated to have been approximately 270,000 tons. Shipments of lime by use and grade for January, 1940, were as follows:

| Use | Quicklime (tons) | Hydrate (tons) |
|---|---|---|
| Agricultural | 742 | 4,498 |
| Building | 12,425 | 17,659 |
| Chemical | 66,014 | 15,921 |
| Total | 79,181 | 38,078 |

## Lime Output Up Sharply in 1939, Figures Show

Domestic production of lime in 1939 was much greater than in the preceding year and probably exceeded slightly the 1937 output of 4,124,165 tons worth $30,091,168, which compares with 1,959,990 tons at $12,302,231 in 1932 and a peak of 4,580,823 tons valued at $42,609,141 in 1925. Sales of lime for building uses have lagged behind recovery in building construction, but gains in consumption for refractory purposes, metallurgy, paper mills, and glass works have helped to offset the losses caused by general slowing down in building activity and competition from other construction materials.

As shown by a recent Bureau of Mines study, very small plants no longer furnish more than an insignificant percentage of the total lime used in the United States. Medium-size companies producing 10,000 to 50,000 tons annually are most regular in their operations. Big companies, producing 50,000 tons or more a year, show wide fluctuations in operating rates. Although kiln capacity has increased steadily, the number of active kilns has decreased. That the industry is apparently overbuilt is evident from the fact that from 1917 to 1938 the output was scarcely more than one-half as much as even the active companies would have supplied if operated at full capacity.

## Ohio Lime Producer Installs Equipment

The National Mortar & Supply Company, Gibsonburg, Ohio, recently installed a Raymond 4-roll high-side mill with a single Whizzer in its pulverized limestone plant. This is connected to a Raymond cloth bag dust collector. On hand for future installation is a 10-foot Raymond mechanical separator with a double Whizzer. This equipment replaces an old ring-roll mill and an old separator.

## Woodville Lime Quarry Opens New Level

The Ohio Hydrate and Supply Company, Woodville, Ohio, has opened a new level in its quarry to drain away from the face. The quarry formerly sloped toward the 60-foot face. The new level tapers from 10 feet at the face to 30 feet at the far end. Wagon drills are being experimented with to work the higher face in 2 levels and these may replace the well drills now used.

# *Insulating* ROTARY LIME KILNS

**PART I**

*By Theron C. Taylor*

"ALL is not gold that glitters." It is not enough that we can prevent heat loss from the shell plates of a rotary kiln by installing heat insulation between the shell and the fire-brick lining. Such insulation may result in no gain in efficiency or capacity. It may be just an added expense and a source of operating trouble.

Many kilns have been insulated. Promises have been made of interesting gains to be accomplished by such action. No doubt some of those who have insulated rotary kilns have been disappointed in the results.

Insulation may be highly effective and pay big returns on the investment by fuel saving and by increased kiln output. To get such results it is important to study some fundamental phases of lime-plant engineering. Insulating problems can be solved on paper at much less cost and with more certainty than they can be analyzed by cut-and-try methods.

The reasons why material gains are feasible, yet are not being realized, can be set forth after a few engineering calculations based upon normal rotary-kiln operating practices.

| | |
|---|---|
| Temperature of combustion | 2,400 degrees F. |
| Temperature of $CaCO_3$ calcination | 1,520 degrees F. |
| High-level temperature range effecting calcination | 880 degrees F. |
| Temperature of $CaCO_3$ calcination | 1,520 degrees F. |
| Temperature of raw-stone feed | 60 degrees F. |
| Low-level temperature range (raising stone temperature) | 1,460 degrees F. |
| High-level temperature range | 880 degrees F. |
| Low-level temperature range | 1,460 degrees F. |
| Total temperature range | 2,340 degrees F. |

The gases which may produce calcination are those above the calcination temperature. Gases lower in temperature than 1,520 degrees F. can accomplish only heating and drying of the raw stone; they are not hot enough to drive off any $CO_2$.

The heat imparted to the stone by the combustion gases is approximately proportional to the temperature range utilized. The high-level heat in degrees F. is $\frac{880}{2,340} = 37.5$ per cent. of the total heat. The low-level heat is $\frac{1,460}{2,340} =$ 62.5 per cent. of the total heat available.

We should add a correction to these percentages because the $CO_2$ driven off from the stone by the high-level heat adds to the total weight of the combustion gases available for low-level heating of the stone. At the usual kiln efficiency these gases from the stone add about 20 per cent. to the weight of the combustion gases and the low-level heat percentage of 62.5 given above becomes $\frac{62.5+20}{100+20} = 69$ per cent. The high-level heat drops to 31 per cent. of the total heat available.

Let us divide the problem of insulating the rotary kiln into four different sets of conditions as follows:

A.—Entire kiln insulated perfectly.

B.—Calcination section insulated; heating part not insulated.

C.—Heating section insulated; calcination section not insulated.

D.—No insulation in any part of the kiln.

*A. Fully-Insulated Kiln.*—Starting with condition *A*, we will first apply the high- and low-level heat to the burning of lime in a kiln that has no heat loss or which, in other words, has insulation of 100-per cent. efficiency.

To make 1 pound of CaO requires 1.8 pounds of $CaCO_3$ and the conversion to lime requires the application of 1,378 B.t.u. of high-level heat. To raise the 1.8 pounds of $CaCO_3$ from 60 degrees F. to 1,520 degrees F. requires $1.8 \times .22 \times 1,460 = 580$ B.t.u. To raise the 1 pound CaO produced from 1,520 to a kiln-discharge temperature of 2,300 degrees F. requires $1 \times .22 \times 780 = 172$ B.t.u.

If we use the 31 per cent. of high-level heat to supply the 1,378 B.t.u. for calcination and 172 B.t.u. to raise the temperature of CaO to 2,300 degrees F. then this 31 per cent. $= 1,378 + 172 =$ 1,550 B.t.u. We will then have left for heating the stone the 69 per cent. of low-level heat amounting to $\frac{69}{31} \times 1,550 = 3,450$ B.t.u. per 1 pound of CaO or 1.8 pounds of $CaCO_3$. But we needed only 580 B.t.u. to heat the 1.8 pounds of stone to 1,520 degrees F. so we have left $3,450 - 580 = 2,870$ B.t.u. of low-level heat.

Had we used all the low-level heat we would have dropped the temperature of the gases from 1,520 to 60, a difference of 1,460 degrees F. By using only $\frac{580}{3,450} = 16.8$ per cent. of the low-level heat we drop the gas temperature only $.168 \times 1,460 = 245$ degrees F. and the stack temperature becomes $1,520 - 245 = 1,275$ degrees F.

*B. Insulated Calcining Zone.*—Now let us turn to condition *B*. We remove the insulation from the stone-heating half of the kiln, leaving the calcining half perfectly insulated as before.

The heat loss through the shell plates for the cooler half of the kiln is about 800 B.t.u. per square foot of surface per hour. This loss will usually amount to about 200 B.t.u. per pound of CaO produced from 1.8 pounds of $CaCO_3$. Referring back a few paragraphs we computed the heat required to raise the temperature of the stone to 1,520 degrees F. as 580 B.t.u.; now we must add to this 580 the 200 B.t.u. wasted through the shell and we have 780 B.t.u. extracted from the low-level gases. But the low-level gases had available 3,450 B.t.u. so we have left over $3,450 - 780 = 2,670$ B.t.u.

We have used or lost through the shell only $\frac{780}{3,450} = 22.6$ per cent. of the low-level heat available and have dropped the temperature of these gases only $.226 \times 1,460 = 330$ degrees F. to get a stack temperature of $1,520 - 330 = 1,190$ degrees F.

By removing the insulation from the rear half of the kiln we have produced no effect on the calcination of the stone. We still burn the same amount of fuel and feed the same amount of stone as when the kiln was insulated throughout. By removing the insulation from the stone-heating half of the kiln we have merely lowered the stack temperature from 1,275 to 1,190 degrees F.

*C. Insulated Stone-Heating Zone.*—Now suppose that we reverse the location of the insulation, removing it from the firing end of the kiln and installing it in the rear half, as in condition *C*. The calcination zone is not insulated; the stone-heating zone is insulated perfectly.

The heat loss through the shell plates for the hotter end of the kiln will be

about 1,000 B.t.u. per square foot of shell surface per hour. This loss is about 250 B.t.u. per pound of CaO produced. This is a loss from gases above 1,520 degrees F.; it is a loss of high-level heat. For each pound of CaO produced we will have to supply 1,378 B.t.u. for conversion plus 172 B.t.u. for raising the temperature of the CaO to 2,300 degrees F. plus 250 B.t.u. for the loss from the shell = 1,800 B.t.u. of high-level heat. To retain the same output as for the insulated kiln we will have to supply $\frac{1,800}{1,550} = 1.16$ pounds, or 16 per cent. more fuel. The increased fuel gives only enough high-level heat to calcine the same amount of lime as under previously-described conditions *A* and *B*.

Going back to those first calculations we will have approximately $1.16 \times 3,450 = 4,000$ B.t.u. of low-level heat available to heat the stone for 1 pound of CaO. We need only 580 B.t.u. and have left over $4,000 - 580 = 3,420$ B.t.u. We use only $\frac{580}{4,000} = 14.5$ per cent. of the low-level heat and drop the gas temperature only $.145 \times 1,460 = 210$ degrees F. from the calcination temperature of 1,520 and have a stack temperature of $1,520 - 210 = 1,310$ degrees F.

*D. No Insulation.*—We have considered the fully-insulated kiln, the kiln with the calcination zone insulated, the kiln with the stone-heating zone insulated; now we come to the fourth and last condition, *i.e.*, the entire kiln without insulation.

The conditions are little different from those encountered when only the rear half was insulated. When we removed the insulation from the calcination zone we increased the fuel consumption by 16 per cent. We continue to require 16 per cent. more fuel than for the first two sets of conditions. As in the second set of conditions, *B*, the only effect of removing the insulation from the rear half of the kiln is to lower the stack temperature. We will have 4,000 B.t.u. of low-level heat available to provide 580 B.t.u. for heating the stone and 200 B.t.u. for the loss through the shell, leaving $4,000 - 780 = 3,220$ B.t.u. to pass to the stack. We extract $\frac{780}{4,000} = 19.5$ per cent. of the heat of the gases, making a drop in temperature of $.195 \times 1,460 = 285$ degrees F. from the calcination temperature of 1,520 to 1,235 degrees F. at the stack.

*Deviations.*—We have not complicated these calculations by some corrections which are minor, or apply in approximately equal amounts to the various conditions.

Perhaps we should have given some consideration to the fact that there is a smaller percentage of stone gas in low-level gases as a result of increased fuel consumption for conditions *C* and *D*. Temperatures would be slightly different but comparative results the same if we had corrected for the variation in specific heats due to temperatures.

We have not considered the tendency of the high-level gases passing high above the bed of the stone in the kiln to become added to the low-level gases and become available for only low-level work.

The loss resulting from the removal of the insulation may be serious if we can not burn 16 per cent. more fuel and must, therefore, suffer a loss in production which in turn increases again the shell losses per pound of CaO produced.

*Conclusions.*—In the beginning we started with the assumption that we had a kiln fully insulated with perfect insulation and we removed the insulation by sections. The reverse situation normally confronts us.

If omitting perfect insulation from the calcining zone increases the fuel consumption by 16 per cent., then, conversely, adding perfect insulation to such part of an insulated kiln should reduce the fuel consumption by

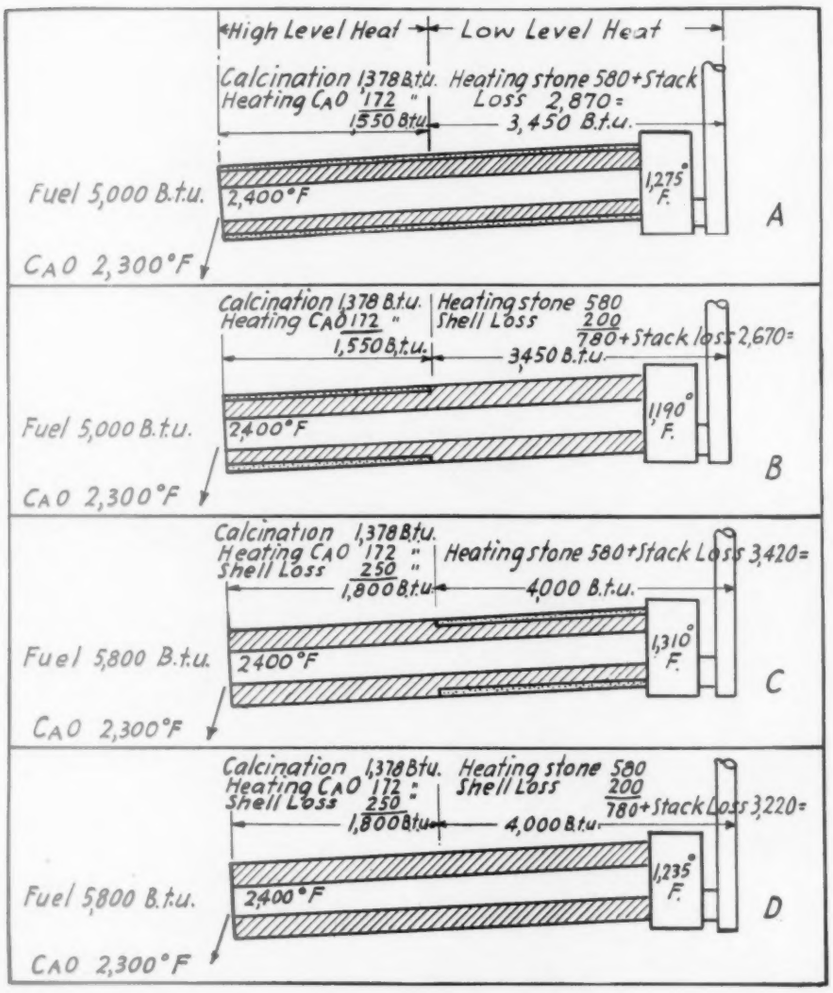
$$\frac{16}{116} = 14 \text{ per cent.}$$

If the capacity of an uninsulated kiln had been limited by burner or furnace capacity it might have had 14 per cent. more capacity with perfect insulation in the calcining zone.

Nothing is gained by insulation installed in the stone-heating zone. Such insulation is undesirable because it will not only raise the stack temperature but will also be a source of added maintenance.

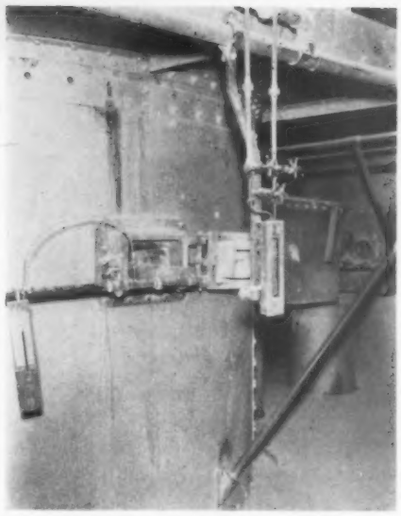
We have talked of perfect insulation. At best we can only approach such ideal insulation. It may be impractical to attempt to reduce the loss of high-level heat through the shell by more than half of the ideal, or about 7 per cent.

The next article will be on the subject of the design, installation and operation of insulation suitable for use in the calcining zone and some suggestions for further research in this field.




Comparative effects of kiln-insulation placement.

# Detachable Buckets Now in Use at Longview-Saginaw's Quarry



One of the mercury meters which indicate the rate of gas feed to the kiln burners.

THE operations of the Longview-Saginaw Lime Works, Inc., at Saginaw, Alabama, have been described in these pages several times in recent years, each time after some noteworthy improvement program had been completed. The last article, in the September, 1936 issue of PIT AND QUARRY, dealt chiefly with improvements in the plant. The principal subject of this article is a new system of quarry haulage which has resulted in lower production costs.

At the time of the publication of the last article stone was being obtained from a quarry about one mile from the plant. Quarry cars were loaded by hand on 16 tracks and pushed to the foot of the incline. A hoist pulled the cars to the top and two gasoline locomotives hauled trains of these cars to the plant. The present quarry is 1,800 feet from the plant and operations there began in February, 1939. The same cars were used and then were loaded on 32 tracks and pushed to the incline. One hoist hauled the cars to the top of the incline and another hauled them to the plant. While this arrangement was an improvement over the previous one, it had its disadvantages. Some rearrangement of the tracks was necessary when blasting was done and it was also a problem to take cars from the various tracks out in turn and keep down the waiting time.

The hydraulic-lift truck picking up a loaded 2-cubic yard bucket. Another bucket is being loaded in background.

A bucket-load of stone being discharged into one of the quarry cars. The loading dock makes possible the loading of cars on two tracks.

Early in October, 1939 the present system was adopted. A Dempster hydraulic-lift Dumpster of the latest type was purchased. This is mounted on an International 2-ton truck chassis and has eight 2-cubic yard buckets. The Dumpster is backed up on docks or ramps on each side of the loading tracks and the stone is discharged into the 2-cubic yard quarry cars. The incline to the top of the quarry was provided with double tracks and a cross-over switch to the plant track. With this system stone for the plant can be hauled out on one track and waste stone can be hauled to a dump on another track without delaying operations. A separate hoist hauls cars to the waste dump.

The stone cars are being hauled out of the quarry in trains of 3 each by a hoist on the top of the kilns 1,800 feet away. A system of horizontal rollers between the rails and vertical guide rollers on the inside of the curve makes it possible for this one hoist to pull the cars up the steep and curved quarry incline, around a long curve, and then up a gentler slope to the plant. Cars return the entire distance to the quarry by gravity. From present indications a cable life of at least 18 months is expected.

The cost of stone delivered at the plant has been cut considerably by these improvements, particularly by the Dumpster, according to company officials. Production has been increased although fewer men are needed for loading, etc., making it possible to keep the plant supplied by working six 10-hour days weekly. Formerly it was necessary to work seven 12-hour days.

When the Dumpster was first oper-

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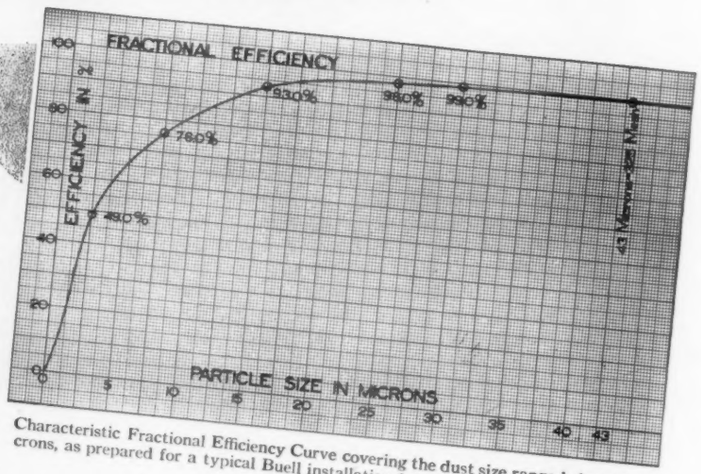


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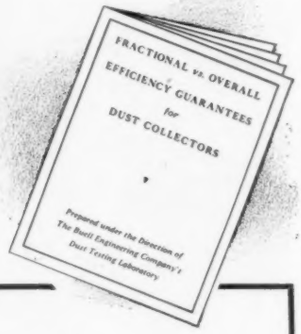


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Two of the buckets are used in the plant for cores picked off the pan conveyor from the kilns.

ated broken rock was used for roadways in the quarry. The sharp edges caused excessive tire wear and the first set of tires lasted only 5 months. Now fine chert is used with the rock to form a smooth road surface and much longer tire life is expected. Waste rock is now being hauled by the Dumpster to fill in a roadway which leads out of the quarry and will be used for hauling this material to a dump.

The Dumpster is also being used to haul away cores picked out of the burned lime in the plant. Two 2-cubic yard Dumpster buckets are placed alongside the picking pan-conveyor running from the kilns. These are hauled away and dumped every morning and night.

Formerly the men at the picking conveyor, in addition to breaking the lumps and removing the cores, also spread the lump lime out evenly over the conveyor for uniform feeding of the crusher. Two sets of swinging spreaders, which have been installed, spread the material more uniformly at a saving in labor. Each spreader consists of 24-inch long sections of 90-pound steel rails. These are suspended from a horizontal steel bar through holes near their top ends. Behind each set of spreaders is a horizontal cross stop bar cushioned at each end by a coil spring which provides enough give for safety.

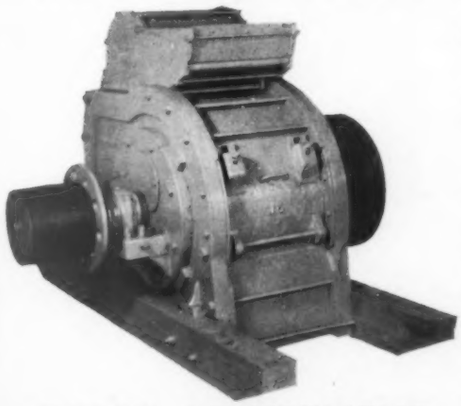
Late in 1939 each of the 8 natural-gas-fired kilns was equipped with a Meriam mercury meter on its gas feed line. This meter gives an accurate reading of the rate of gas feed at any time and is used to adjust the feed to the kiln's requirements. With this meter an experienced operator can eliminate the usual occasional under- or over-burning. After a kiln is drawn this meter is of great help in bringing a kiln back up to efficient calcining temperature. A saving of over 10 per cent. of the fuel cost per ton has resulted from its use.

Another improvement to be made will make possible the production of a wider range of sizes of lump lime. The lime will be fed from the present bins in the plant to a Montgomery Coal Washer Company double-roll crusher and a vibrating screen. The products can then be loaded direct into cars, drums or sacks or can be fed to the hydrating department.

Left to right: W. B. Epperson, pay-roll clerk; E. M. Snow, superintendent; J. C. Knox, plant foreman; L. F. Stagner, quarry foreman.

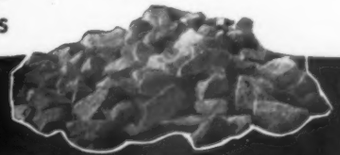

**For Producing *Low Cost* Agricultural Lime**
**Use a DAY Swing Hammer PULVERIZER**

*Write for DAY Bulletin*



**You can get *big tonnage per horse-power* when you use the powerful DAY Roller Bearing Pulverizer. Handles any size stone that will pass feed opening, and has a wide crushing range. Only a matter of minutes for spacing screen bars for any fineness from agricultural lime and small aggregates to coarse road stone. One-piece hammers of manganese steel. Reversible grate bars of high carbon tool steel. Five sizes for capacities up to 20 tons per hour of agricultural lime. Furnished either in portable or stationary units.**

QUICK ADJUSTMENT
for various sizes of materials



Brooks EQUIPMENT AND MFG. CO.
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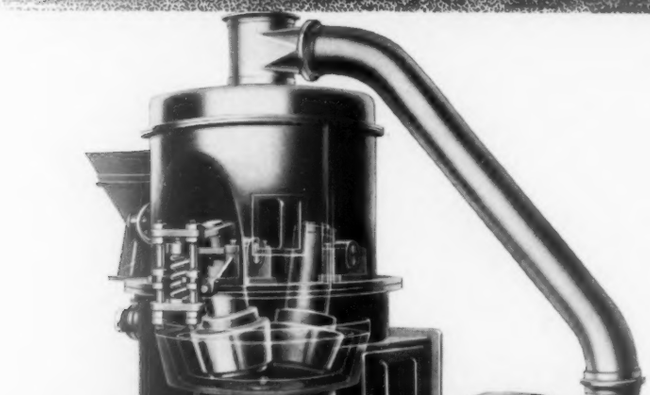
# What the well-equipped LIME



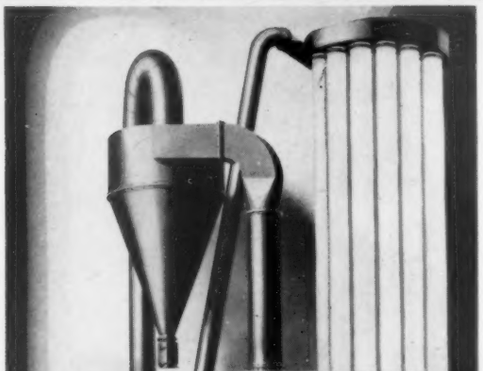
## For FIRING ROTARY LIME KILNS
## RAYMOND BOWL MILL

The first step in equipping a plant for lower costs is the use of the Bowl Mill for direct-firing rotary lime kilns.

This modern unit pulverizes coal to uniform fineness at low cost, producing high quality burnt lime. Heat from the kiln is introduced into the mill for drying the coal.

Wide capacity range . . . accurate control of powdered coal delivery by adjusting automatic feeder . . . and uniform fineness maintained regardless of output.

One standard constant speed motor operates both the mill and fan. No metal-to-metal contact in grinding assures noiseless operation and freedom from vibration.



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## RAYMOND ROLLER MILL

This latest type of whizzer-equipped Roller Mill does a complete job of finish grinding . . . dries, grinds, classifies and conveys the product to storage by one continuous, dustless, automatic operation.

It gives economical production in pulverizing quicklime to any desired grades from 50-mesh material to 99% passing 200-mesh. Any specified fineness can be obtained by changing the speed of the whizzer, as in making various grades of ground limestone from 55% through 200-mesh to 99% passing 325-mesh.

It is ideal equipment for drying and grinding agricultural limestone, dolomitic and fertilizer limestone, also for finely ground fillers used in the paint, rubber and paper industries.

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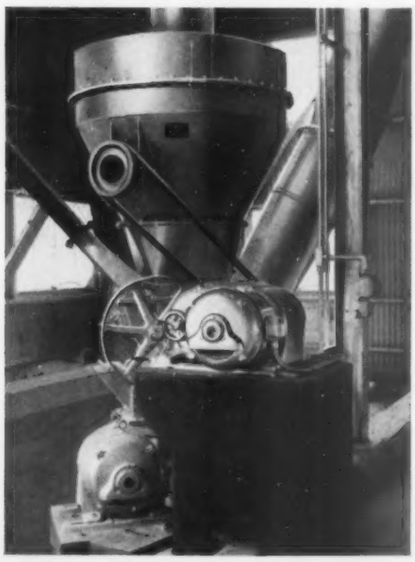
It takes the lime from the hydrate bin, disintegrates and classifies the material . . . rejects the hard particles and other impurities . . . and delivers a uniform finished product of high quality.

The classification of the lime is easily controlled by means of the whizzer, and any fineness can be produced from agricultural lime up to superfine chemical hydrate, testing 99.5% through 400-mesh . . . and without loss of good hydrate.



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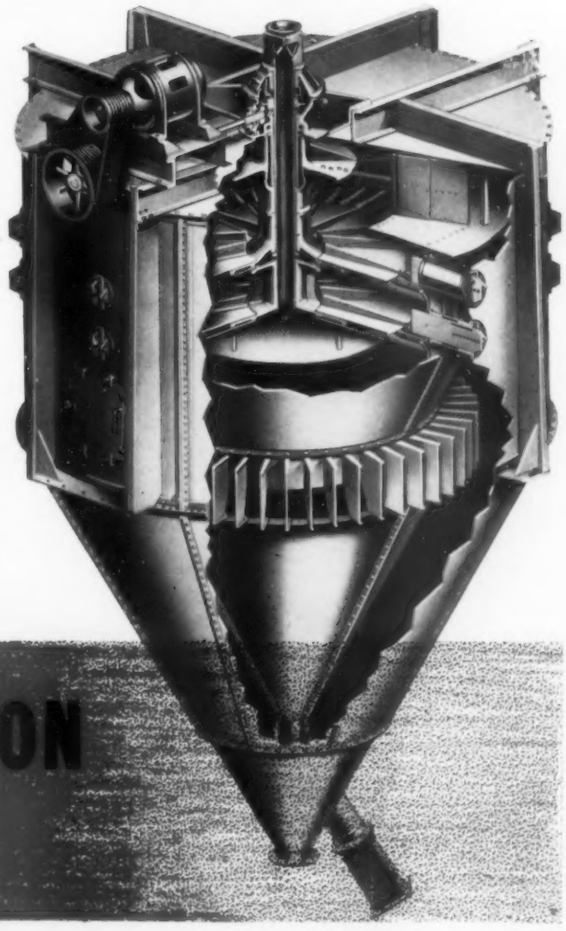
The double whizzer type of Raymond Separator is used for making extremely fine and uniform products. It may be operated in connection with a grinding mill or arranged to take the feed direct from the hydrator.

By the latter method, the Separator removes the available fines and discharges the oversize to an Automatic Pulverizer for further reduction and final recovery of the remaining good lime.

This is a highly efficient operation, as the whizzer blades help to break up the lumpy material for more complete separation. It is proving its economy in scores of plants for producing the finest grades of chemical hydrate.



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A general view of property with rock plant at left, lime plant in center, and concrete-block plant and storage building at right.

# Newest Florida Lime Plant Calcines Product in Oak-Fired Vertical Kilns

By W. E. TRAUFFER

THE Cummer Lime & Manufacturing Company recently completed the first year of operation of its model lime and concrete-block plants at Kendrick, near Ocala, Florida. These plants added to the company's line a new masonry building unit and a complete assortment of lime products including quicklime, chemical hydrate, masonry hydrate, spray lime and agricultural lime. Both plants involve the latest in design and equipment and are of permanent fireproof construction using all-welded steel and concrete. The various forms of lime manufactured are sold under the trade name of "Cumpur" and the building units as "Cumroc."

These new operations bring the parent company, the Cummer Lumber Company, one of Florida's pioneer industrial concerns, into Florida's new industrial epoch with an expanded sphere of activity. The history of the Cummer Lumber Company is one of continuous development of Florida's natural resources. The company was organized in 1882 in Michigan, where it engaged in pine and hardwood lumbering near Cadillac and Morby. While operating there vast land and timber holdings were purchased in Florida.

In 1896 the Cummer Company built a large sawmill in Jacksonville, Florida, where pine was cut until 1918. Development of its land holdings in the north central part of the state was begun in 1899, when the company built the J. S. & W. Railroad to Newberry and Trenton for pine-lumbering operations.

The company's deposits of high-grade phosphate in Alachua County were opened in 1900. The rock was crushed at the mines and shipped to Fernandina and later to Jacksonville, where the company maintained plants, warehouses and loading terminals.

Early in the century the company enlarged its mill facilities in Jacksonville to include a box factory and a cypress sawmill. In 1911 a subsidiary, the Cummer Cypress Company — name subsequently changed to Cummer Sons Cypress Company—erected a mill at Sumner, Florida, and began to log its holdings of Suwannee River cypress. In 1922 a mill and a box factory were built at Lacoochee and a veneer plant at Otter Creek. Both these operations are still functioning, producing cypress lumber and fruit and vegetable boxes and crates.

During that same year the Cummer Lumber Company began to develop its huge limerock deposits at Kendrick, estimated to total over 10,000,000 tons of limestone of high purity, averaging 99.5 per cent. calcium-carbonate. A number of different quarries and plants were developed, producing chiefly road rock. The plant from which rock is supplied to the new lime plant was built in 1938.

The quarry from which the rock and lime plants are supplied consists of typical Ocala lime rock. This quarry has been developed to a 90-foot-high face which is worked as a single bench. Blast holes are drilled to a depth of 6 feet below the floor level with a 3½-inch Keystone well drill. Holes are first sprung and are then shot with 30 per cent. explosive. Some secondary shooting is also done with holes drilled by jackhammers. About 3½ tons of rock are obtained per pound of explosive. The overburden averages 3½ feet and is removed by a drag-line. The eroded surface of the rock is then cleaned by hand.

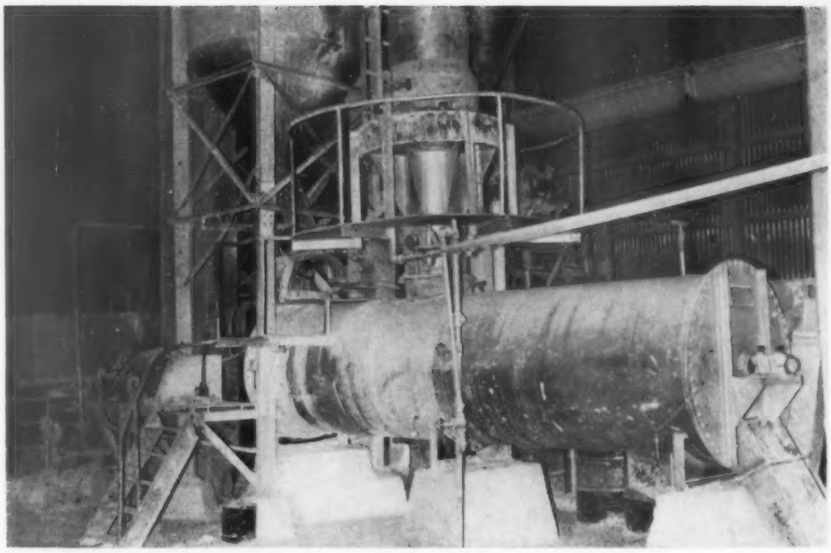
A 1-cubic yard steam shovel loads the stone into 4-cubic yard end-dump cars which are hauled up an incline to the plant by a friction hoist. The rock is

The monolithic-concrete office and laboratory building located on a main highway is a good advertisement for the company's products.

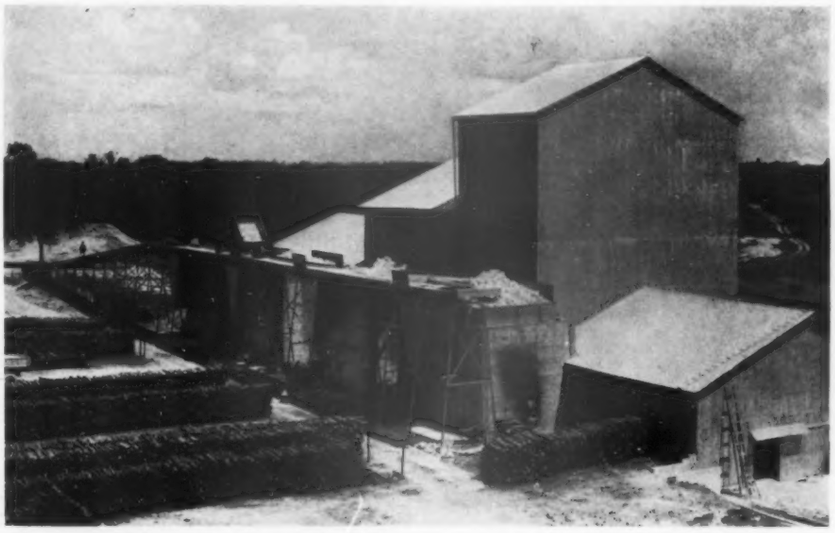
reduced by a McLanahan & Stone 22-inch by 72-inch single-knobbed-roll crusher. The product drops into a bin from which it is loaded into cars for shipment. Most of this material is used as highway road base and a growing amount is used in the construction of lime-rock concrete buildings. This plant, together with the older rock plant, has a capacity of about 2,500 tons daily.

The crusher and hoist in this plant are driven through belts and lineshafts by a 125-horsepower, 2-cylinder Fairbanks-Morse Diesel engine. This engine can also be connected by belt to a generator to supply power for both the lime and block plants or either one, as desired. Ordinarily commercial current is used to operate these plants.

The rock for the lime plant is selected and loaded by hand into trucks in the same quarry. Ford and Chevrolet dump trucks haul this stone up a 7 per cent. grade out of the quarry and up an earth-fill ramp to a wooden platform from which it is discharged into the kilns.



The 3-ton per hour continuous hydrator with quicklime bins and crusher at left. Return screw-conveyor to beater mill is above at right.



A view of the lime plant with ramp to the four vertical kilns at left. An ample supply of wood is shown.

The four kilns are 18 feet square and 24 feet high with firing floor 9 feet from the bottom. Their circular burning chambers taper from a diameter of 7½ feet at the top to 9 feet at the bottom. These kilns are built of solid lime rock with fuller's earth insulation between this and the fire-brick lining. Native oak is used for fuel. The kilns are drawn every 8 hours into chambers from which the lime is carried in wheelbarrows to the floor, where the lime is sorted and the cores are removed. Each kiln has a capacity of 5 tons daily.

The quicklime is loaded into barrows and dumped into a McLanahan & Stone 18-inch by 30-inch single-knobbed-roll crusher. A 45-foot steel-inclosed elevator carries the lime to a stationary screen with ¾- and 1½-inch openings. The plus ¾-inch lump lime is discharged into a tank from which it can be loaded into bags or drums. A screw-conveyor is used to load the bulk lump lime into cars.

The minus ¾-inch quick-lime drops from the screen into the hydrator-feed bin. This material is automatically fed into a Kuntz continuous hydrator with a capacity of 3 tons per hour. An inclosed elevator and screw-conveyor feed a 6-foot Sturtevant mechanical separator, the product of which is spray lime.

This is fed by a screw-conveyor to another elevator from which a screw discharges it into a 100-ton bin. This material is discharged into the hopper over a 2-tube bagger.

The rejects from the separator are discharged through a chute into a second 6-foot Sturtevant separator. The product of this separator is masonry lime and is carried by a screw-conveyor, elevator and another screw in series into a 100-ton bin over a 1-tube bagger. The rejects from this separator are carried by a screw-conveyor to a Kuntz beater-mill over the hydrator into which it discharges its product.

When pulverized quicklime is to be made all the lime from the roll-crusher is discharged from the elevator direct to the beater-mill just mentioned. The mill product is then carried by the hydrator screw to the elevator feeding the first separator. Rejects are returned to the beater-mill. One of the product elevators carries the separator product, pulverized quicklime, into a third circular steel bin of 40-ton capacity which

(*Continued on page 47*)

The two 6-foot mechanical separators which control product fineness.

# LIME PRODUCERS

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Hammermill and Ring Crushers

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DETROIT

# Kimbalton Builds Plant to Care for Growing Demand for Pulverized Stone

THE growing demand for agricultural limestone and other ground limestone products has been responsible for a rapid expansion of the facilities for its production. Producers of crushed limestone and lime, who formerly were able to supply the local demand from stock-piles of otherwise useless waste material, have had to install equipment to produce more of it and to grade it for various uses. Lime manufacturers in particular have gone into the production of this material because of the suitability of their stone.

One of the latest to enter this field is the Kimbalton Lime Company which has produced lime at Kerns, Virginia, since World War days. A new and modern plant for the production of ground limestone was built alongside the lime plant and this went into operation in January, 1940.

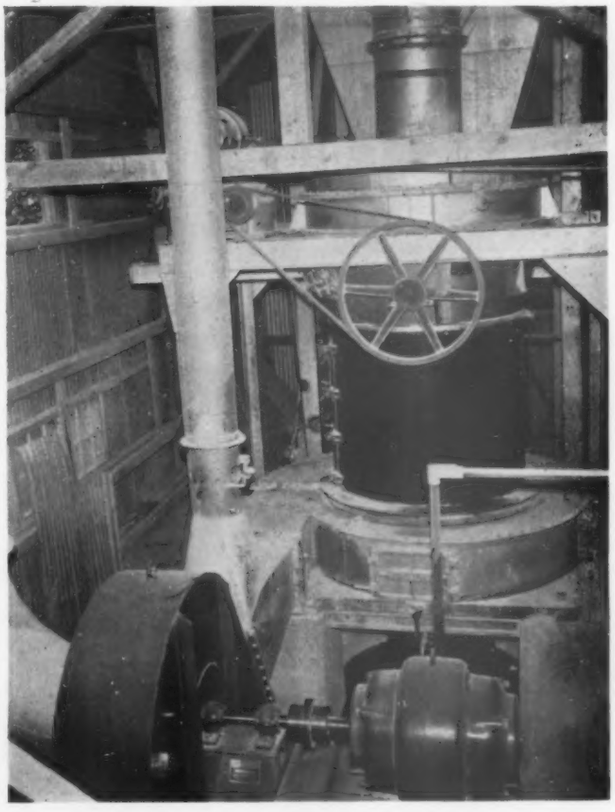
Stone is discharged from quarry cars through a chute into a 75-ton wooden storage bin. A Columbus pan-conveyor feeds a Gruendler hammer-mill which takes up to 10-inch stone and reduces it to ¼-inch minus. A steel-inclosed belt-bucket elevator discharges this material through a spout into a 12-ton steel bin. Material is drawn from this bin through an automatic variable-speed feeder to a Raymond 4-roll high-side mill which is equipped with an integral double Whizzer separator and a cyclone. The product can be discharged from the cyclone into spouts for bulk loading of cars or trucks or into a bin over a valve-bag packer. The mill is driven through Manhattan Condor V-belts by a 75-horsepower Master motor and the fan is driven through a Fasts flexible coupling by a 50-horsepower Master motor.

With this equipment the company is able to produce from 4 to 8 tons per hour of various types of ground limestone products. The finest product yet made is used for dusting coal mines to prevent explosions and this material, 85 per cent. of which passes a 200-mesh screen, is made at the rate of 4 tons per hour. Calcium carbonate used for poultry feed and other purposes is ground to 55 per cent. through 200-mesh at the rate of 5 to 6 tons per hour. Agricultural limestone and other coarser products are made at the rate of 7 to 8 tons per hour.

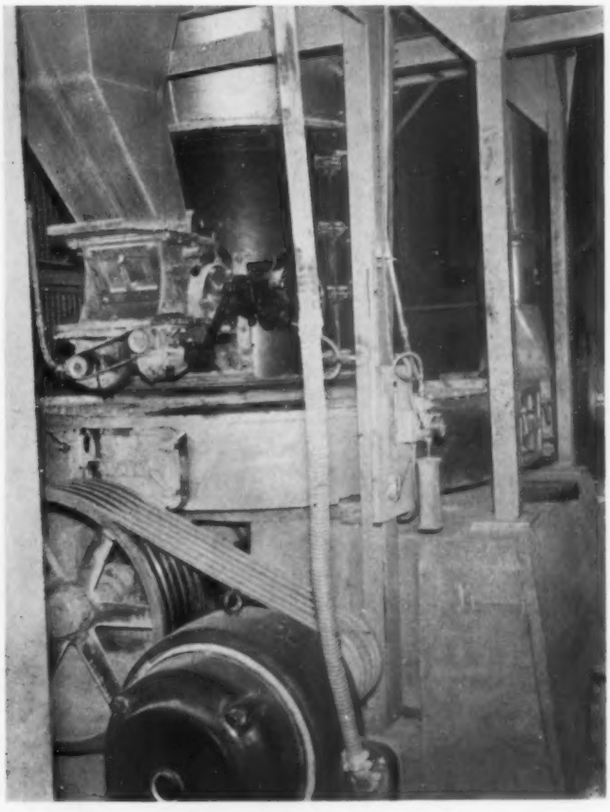
The deposit from which the company's raw material is drawn had been operated for some years as a flux-stone quarry when the company took it over. The original 1-kiln lime plant was built during the World War and three more kilns and the hydrating department were added within a few years. Prior to the erection of the pulverizing plant described above the last addition to the plant was made 6 years ago when equipment for the production of masonry cement was installed.

The deposit is a high-calcium limestone with a silica content of less than 1 per cent. Open quarrying methods were used until 1939, when the overburden became excessively heavy. Mining methods are now used and stone is loaded by hand into quarry cars. Two Brookville gasoline locomotives haul the stone several hundred feet to a trestle from which it can be discharged into the kilns or the pulverizing plant.

The four vertical kilns are coal-fired



The 4-roll high-side mill with fan in foreground and variable-speed separator drive at upper left.



Another view of mill with automatic feeder at left. In foreground is motor driving mill through V-belts.

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Where the exceptionally high efficiency of Cottrells is not required, Multiclone Mechanical Collectors provide economical dust recovery down to the lower micron sizes. Multiclones are all-metal, compact, fireproof and have nothing to clean, repair or replace. They have the highest efficiency in proportion to space occupied and power input. In addition to their wide application for plant clean-up and ordinary dust control, Multiclones collect fine powders from spray dryers and other manufacturing processes. Made for any gas volume and particle concentration.

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# COTTRELL ELECTRICAL PRECIPITATORS
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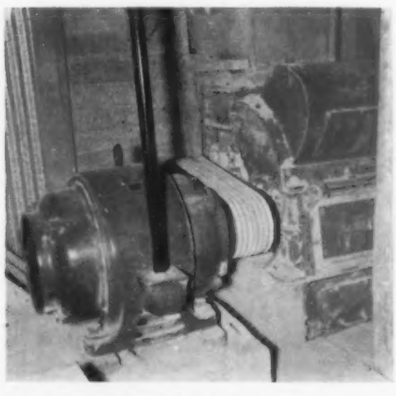
The new pulverized-limestone department with lime plant in background. Cyclone connected to mill is shown.

The rotary valves through which lime and cement are fed to scale-mounted mixer.

and produce a total of 60 tons of lime daily. Lime is drawn into barrows and is picked on the floor. It is then fed to a vertical-shaft roller-crusher and elevated to a bin feeding the 1-ton batch hydrator. A screw-conveyor feeds the hydrated lime to a Raymond beater-mill with a cyclone from which the product goes into a bin over a bagger for masons' lime. For the production of chemical lime the hydrator product is fed from the same screw-conveyor to an elevator feeding a 7-foot Raymond mechanical separator. The product goes to a bin over another bagger. Pulverized quicklime is made by a Jeffrey hammer-mill from which it is elevated to a bin for loading into open-top bags, drums or cars.

For the production of masonry mortar a screw-conveyor carries the hydrated product of the cyclone to a bin. Portland cement in bulk is carried by a screw-conveyor and elevator into another bin. Fuller Company rotary valves under each bin control the feed of the lime and cement into a Sprout-Waldron spiral-blade horizontal mixer. This mixer is mounted on the framework of a Fairbanks-Morse beam scale and one material at a time is weighed into the mixer to make a 2,500-pound batch. After being thoroughly mixed the masonry cement is discharged into a bin over a packer.



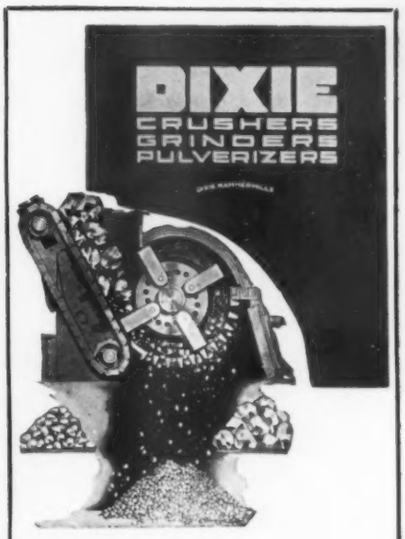
The hammer-mill which breaks down stone for the mill.

## Cummer *(from page 43)*

serves the 1-tube bagger already mentioned.

The Cummer company is a member of the National Lime Association and has the benefit of all the invaluable information on technology, markets, sales methods, etc., developed by that body.

Part of the chemical and physical testing laboratory.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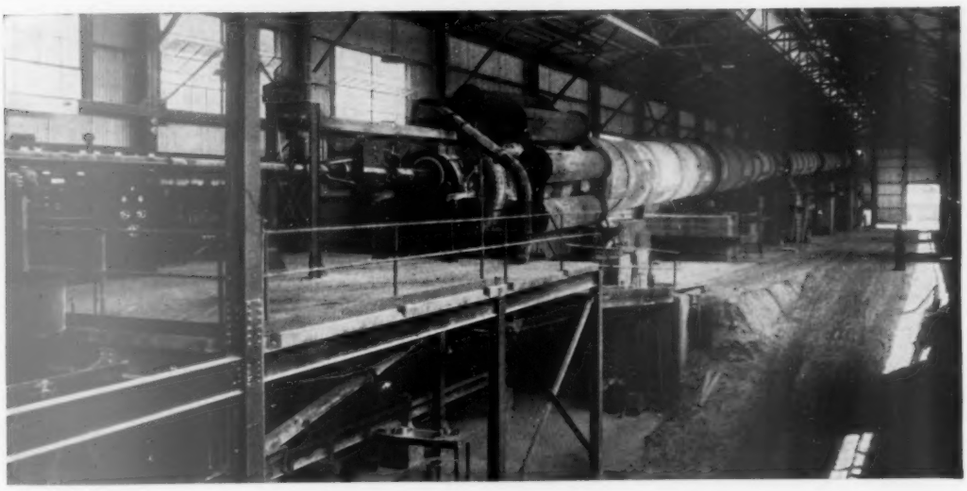
# UNAX ROTARY KILNS FOR LIME BURNING



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● **The Kiln illustrated is installed in the lime plant of H. E. Millard, Annville, Penna.**

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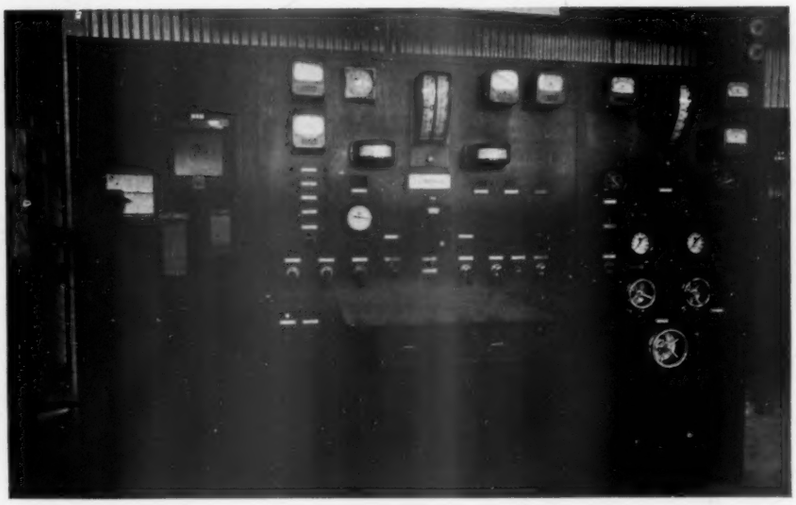

The **FLS Centralized Kiln Control** concentrates at one convenient point the control switches of the kiln and auxiliary equipment, sequence interlocks, alarms, signals, and instruments showing speeds, draft, temperatures, etc., constantly presenting to the kiln operator a clear, quick picture of the kiln's operation.

The **FLS Gas Analyzer permits** obtaining complete combustion of the fuel while avoiding excess air in the kiln.

F. L. Smidth & Co. are manufacturers of Rotary Kilns, Coolers, Grinding Machinery and auxiliary apparatus, and in addition are Engineer Specialists in designing and equipping plants employing such machinery.

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# Manufacture of Mineral Wool Becomes More Complex As Industry Grows

**By MATT L. KUYKENDALL**
**Vice-President and General Manager**
**Insulation Industries, Inc.**

MINERAL wool is a comprehensive name covering a number of similar products distinguished chiefly by the raw materials from which they are made, as follows:

*Rock wool,* made from natural rock used alone or from a combination of natural minerals,

*Slag wool,* made from iron, copper, lead or blast-furnace slag alone or mixed with other materials, and

*Glass wool,* made from silica sand, soda ash and limestone, with or without scrap glass or other materials.

The year 1940 marks the one-hundredth anniversary of the first commercial production of mineral wool. It was first produced by man in Wales in 1840, where it was used mostly as an insulator for boilers and steam pipes.

According to an ancient legend, frequently heard throughout the South Sea Islands, the Goddess Pele lived in the Pit of Kilauea of the Kilauea Volcano in the Hawaiian Islands. The lands around the volcano supposedly belonged to the Goddess Pele and the natives firmly believed in her existence. When she was angry, it was believed, she destroyed their crops and houses by eruptions of the volcano and when severely angry she tore her hair and cast it to the winds. After serious eruptions, if the wind was blowing strongly, fine silken threads were found. Natives gathered these strands of natural mineral wool, created by the action of the wind on the molten lava, believing them to be strands of Pele's hair and thereby proved her existence.

Practically the same chemical composition developed mechanically in cupolas or furnaces forms the mineral wool of to-day. The process is fundamentally the same. Molten rock or other minerals blown by air or steam are gathered in large settling rooms and fabricated into various forms for insulation purposes.

Mineral wool was produced in Germany in the latter part of the eighteenth century and used largely as trimming for Christmas trees and for other decorative purposes.

Production of mineral wood in the United States dates from 1875, about three years after its first manufacture in Germany. The first plant in America was established at the Greenwood Furnaces in Orange County, New York. Mineral wool was also manufactured at the Isabella Furnaces near Pittsburgh, and in 1890 the Salem Mineral Wool Company was organized as a part of the Salem Furnace Company. This venture was discontinued in 1891 because of unfavorable economic conditions.

There is a record of mineral wool having been sold about fifty years ago to insulate a house now owned and occupied by W. R. Cross, the mayor of Salem, Virginia. Examination of this material shows it to be in the same condition as when installed and in its fifty years' use no signs of deterioration can be observed. Mayor Cross of Salem writes that he has never experienced any dampness in the walls and that the timbers and interior walls are in first-class condition.

The home of Grover Cleveland, one-time President of the United States, was built and insulated with mineral wool in 1890.

Mineral wool was first made in Alexandria, Indiana, in 1897 by C. C. Hall, who is generally spoken of as being father of the industry. Mr. Hall was employed at that time by St. Louis interests as chief engineer and manager of a steel plant that he designed and which was erected under his supervision at Alexandria.

In a search for a suitable rock for fluxing purposes in the operation of the steel plant Mr. Hall discovered the peculiar composition of the local rock deposits. He resigned his position with the steel company and began experimenting with the rock, first to see if it would melt and then later to see if it could be made into a fiber. Mr. Hall's first production was on the premises of the steel plant, which was soon absorbed by other interests and was moved to another city. He and some friends then formed a corporation known as the Crystal Chemical Company to manufacture mineral wool from the native rock on a commercial scale. They operated successfully until 1901 when they sold the plant to a St. Louis company. This company became the nucleus of what is now the General Insulating & Manufacturing Company of Alexandria.

Mr. Hall continued in the employ of the new owners until 1906, when he withdrew and formed the Banner Rock Products Company in September of that year. This company has operated continually since January of 1907 and was purchased about 1928 by the Johns-Manville Corporation.

At the close of 1929 there were 5 companies operating 8 plants engaged in the manufacture of rock or mineral wool in the United States. These 8 plants were operating 28 cupolas in 5 states and produced in that year approximately 50,000 tons.

By 1935 the number of plants had increased to 41, located in 14 states, operating 121 cupolas and producing in 1935 approximately 400,000 tons of all classes of mineral wool, glass, rock and slag.

At the close of 1939 there were 72 producing companies, operating 83 plants in 19 states with a capacity equivalent to that of 170 cupolas. Production in 1939 is estimated at 500,000 tons. The estimated capacity of the plants in existence in 1939 is 600,000 tons. While the industry's dollar volume for 1937 was slightly greater than for 1939, the total tonnage in 1939 was the largest so far produced by the industry. This fact clearly indicates a decline in the price per ton for the mineral wool produced.

The industry has also made great strides in production methods, and equipment that produced 8 tons per day a few years ago is now producing 15 to 20 tons per day. This progress has materially increased the overproduction in the industry. It is, therefore, clearly evident that the production now available is considerably in excess of the demand, in spite of the definitely increasing demand for mineral wool.

It was not until 1927 that mineral wool came into general use as home insulation. It was first used chiefly in new construction and installed while the house or building was in the process of construction.

About 1930 a process or method of installing mineral wool in the walls, partitions and attic floors was developed and has since become a large industry. This type of installation is accomplished by the use of pneumatic blowing equipment. A hole is cut into the exterior wall of the building or house to be insulated. After sufficient siding, bricks or shingles have been removed to allow such an opening to be made, granulated wool is blown into the walls or floors without disturbing the interior of the house. The siding,

bricks or shingles are replaced, leaving no trace of the openings that have been made.

Some manufacturers have gone into this field extensively, setting up their own contractors or installing agents and soliciting this type of insulation business direct from the home owner. Others have appointed agents on a franchise or agency basis to further this kind of sales effort. Others merely sell the granulated or nodulated wool to anyone who has the blowing equipment necessary to install it in houses that are already built.

Since practically every new house that has been built in the last ten years has some form of insulation installed during construction, this market has not increased; in fact, it has diminished at least by the number of houses or buildings that have been insulated subsequent to construction.

On the basis of this theory, the next ten years will see the business of insulating houses and buildings already built practically ended and the future of mineral wool for home insulation will be governed by new building activity.

When mineral wool first began to gain recognition as home insulation, most of it was sold in the loose or bulk form. The mineral wool was gathered from the receiving room or the conveyor, as the case might be, and packed into a suitable bag made from either burlap or paper. The bags were delivered to the job, the wool taken out and hand-packed between the studding of the side-walls and the joists of the up-stairs ceiling. If installation of mineral wool in this manner is performed conscientiously and carefully, it will produce a satisfactory and efficient result.

Such a method, however, seemed obsolete, when placed alongside modern methods of installing other building materials, and a search was begun for a more efficient means of using and installing mineral wool. Out of this search came the modern mineral-wool batt. A sufficient quantity of resin or binder was put into the wool during the process of manufacture to cause the felted mineral-wool fibers to be bound together so that the mass had some rigidity and tensile strength. The material was cut into oblong shapes of the proper size to fit into the stud spaces, usually about 15 inches by 23 inches. The batts have a uniform density and are quickly and easily installed. They can readily be cut to fit irregular spaces and are rapidly gaining in favor and acceptance by the consumer, the builder and the architect.

Without doubt the demand by the owner building a new house for automatic heating and air-conditioning equipment has stimulated the demand for mineral-wool insulation, as such equipment operates much more efficiently in a well-insulated house. Most mineral-wool batts now have vapor-barriers or water-proof membranes attached to them and this type of material is recommended where air-conditioning or humidifying equipment is to be installed. The producton of mineral wool in 1939 reflected a growing trend towards the use of thicker and more efficient mineral-wool insulation. The production of mineral wool batts and strips for 1939 was approximately 50 per cent. greater than in 1938.

In the earlier days of mineral-wool manufacture very little skill and a comparatively inexpensive and small amount of equipment were required. A simple water-jacketed cupola, some sort of boiler, oftentimes an old threshing-machine engine to generate steam, and a settling or receiving room were about all that was required. The rock, slag or mineral was melted in the cupola and blown by steam into the settling room until it was full. The room was then opened and the material thrown out with pitch forks and stuffed into bags and was then ready for shipment. Many such plants were put into operation with a capital outlay of less than $10,000.

Most of these plants were located near the sources of raw material and served only a small area around them. Since the material is very light in weight and very bulky, only 12 tons can be loaded into a 36-foot box-car. Most of the earlier manufacturers were making their product from natural rock and were located immediately adjacent to the sections where the rock could be obtained. All the known deposits of rock were located in small, sparsely-populated sections and materials shipped to large centers of population had freight charges added all out of proportion to the value of the product.

It was soon discovered that a product satisfactory in quality could be made, with small amounts of added material, from the slag obtained from various kinds of smelters and blast furnaces. Such smelters and furnaces are usually located in or near large centers of population and mineral-wool manufacturing plants began to spring up in the large cities throughout the country. This was a logical and economical development, as it is much cheaper to manufacture mineral wool close to its market than it is to pay high freight rates to the market because of its inherent characteristics of lightness and bulk. Since 1935 the demand for batts and other fabricated products has brought about startling changes in the equipment needed and in manufacturing practice as well as a demand for better quality in the finished product.

It is not feasible to make mineral-wool batts without a moving conveyor on the bottom of the receiving or settling room which will bring the wool out in blanket form instead of having to throw it out with pitch forks. Neither is it practical or economical to cut the batt into proper size or shape by hand methods, so automatic cutting equipment is needed to produce batts of uniform size and accurate dimensions. Most manufacturers have also installed some type of drying equipment so that the binding material used to hold the fibers together, thus producing a rigid or semi-rigid and tough batt, will be thoroughly dried when it comes from the conveyor. Additional equipment is required to cement the water-proof vapor-barrier properly to one side of the batt.

Several of the larger manufacturers have recently introduced a new mineral-wool product in blanket form, which is completely encased in paper. The paper on one side of this product is moisture-proof and thus acts as a vapor-barrier. Nailing flanges are provided on the edges. The material is made in various thicknesses. It is usually sold in large rolls or long strips folded into a carton, and this product has been well received by the trade. It now appears that any manufacturer, who wishes to be competitive, will eventually have to produce a similar product or lose a substantial portion of the volume available. To do this will require more machinery and handling equipment.

The old-fashioned mineral-wool cupola was charged manually. To-day many manufacturers have mechanical charging equipment, which decreases the amount of labor required, consequently lowering labor costs and making the level of production more constant, and, as a result, a more uniform product.

All mineral-wool furnaces of the cupola type require a flow of air from a mechanical blower. In the early days of the industry this flow of air was regulated manually. To-day many manufacturers have automaitc equipment controlled by temperatures and barometric pressure, so that this flow of air is constant in volume and temperature, again lowering costs and improving quality.

Almost every day new methods and equipment are found to increase production and raise the standards of quality. In the early days of the industry chemical control or supervision was believed unnecessary. There were no standards of quality and mineral wool was mineral wool and practically no thought or attention was given to its

chemical composition. To-day most manufacturers have either laboratory facilities in their plant or employ consulting chemists or other means of chemical control and supervision. No quality standards have yet been set by the industry, but the problem is being discussed by the manufacturers and their association and it is quite probable that some standard will be established in the near future with the ultimate purpose of raising the quality of the material produced by all members of the industry.

As mentioned above, it was entirely possible ten years ago to erect a mineral-wool plant containing two cupolas for about $10,000. To-day a modern mineral-wool plant of two cupolas with adequate storage space and the modern equipment discussed above will cost approximately $100.000. Such a venture would require working capital of $25,000 or $30,000. It is, therefore, apparent that the mineral-wool business is no longer one for small investors or inadequate capital. The time has passed when the small mineral-wool manufacturer could operate his plant on Monday and Tuesday, go out to the trade and sell his production on Wednesday and Thursday and, while so doing, collect enough money to meet his pay-roll on Saturday.

The mineral-wool buyer has become more conscious of quality and will no longer accept any material called "mineral wool" stuffed into paper bags. He is not only demanding quality but is demanding advertising material and sales effort to assist him in selling mineral wool. The industry has grown to the point where its production will have to be merchandised along much the same lines as are other well-known insulating and building materials.

Like all new industries, the mineral-wool industry has passed, or will have to pass, through three or four stages. The first stage might well be called the "cream" stage. During this stage the small manufacturers with small capital rush into the business, take whatever profit is available through small, rather crude manufacturing processes and then fade out of the picture as the competition becomes more keen and the quality demands become greater.

The next stage might well be called the "milk" stage. Most of the cream has been taken off. The industry settles down into efforts to produce a better material in larger quantities to be sold profitably at lower prices and with a smaller margin of profit.

The third stage might well be called the "skimmed-milk" stage, the stage in which all the cream has been taken off and the product produced by the industry is no longer a novelty or untried experimental product which isn't accepted by the dealer, builder or architect, but a commodity which is in demand. In this stage there is a constant battle between producers to make more and better material and constantly lower selling prices. Large volume and small profits are recognized parts of this stage.

The fourth stage, if it comes, will be the "water" stage, in which all the cream and milk will have been taken away and nothing but large volume and rare opportunities for profit will remain.

Many very large commodity industries have passed through these four stages and have experienced difficulty in getting back into what I have called the "milk" or "skimmed-milk" stage. Almost invariably overproduction is the cause of these difficulties in any industry and it would seem highly advisable for any manufacturer or producer of raw materials, who is considering entering the mineral-wool industry, to consider very carefully the facts outlined above.

## Use of Substitutes Hurts Mica Market

Consumption of sheet mica and splittings during the last quarter of 1939 probably exceeded even the pace set during the first half of 1937, but owing to reduced activity during the earlier months the totals for the year fell short of a record although they probably exceeded the totals for 1938. Prices remained virtually unchanged until the outbreak of war in Europe touched off demand and threatened to create a shortage in Indian and Madagascan splittings. Stocks of splittings and of certain kinds of radio and electrical mica were abnormally heavy at the beginning of the year, and were well-maintained until consumption was stepped up in September and deliveries from Calcutta virtually ceased. In December one large consumer used up its stock of its most important grade of splittings, and none of the companies were able to maintain their raw-material inventories. At no time was there any dearth of supplies in Calcutta, but the heavy movement of burlap and other commodities resulted in a shortage of shipping space. This situation, however, began to improve toward the end of the year as more ships were routed from India to the United States. Shipments of amber splittings from Madagascar came under the French Government control and not until after the end of the year were licenses obtainable for even limited quantities for export to this country.

South American mica was freely offered throughout the year, and shipments came through with relatively little interference caused by war conditions. Domestic production was speeded in North Carolina, New England, and especially South Dakota, but production statistics are not yet available.

Prices of domestic mica advanced sharply, particularly on small sizes. Argentine and Brazilian sheet mica rose an average of perhaps 10 per cent. over the relatively high levels reached in 1938. For Indian splittings sterling prices and freight and war-risk insurance increased greatly, but in respect to bulk lines used in the manufacture of built-up mica products these increases were virtually offset by the decline in exchange. For more expensive classes of splittings, however, such as are used in insulating tapes, there were slight increases: No. 5 book packed splittings, for example, advanced from $1.25 to $1.40 a pound. The delivered cost of radio mica at American factories remained about the same as before the war despite the increases in sterling quotations. A threatened shortage of "cigarette" mica for airplane spark plugs was averted by employing selected domestic sheet.

Definite progress was made during the year in the development of Alsifilm as a substitute for mica splittings. This interesting product is made from bentonite, and after experiments with raw material from many domestic localities and from foreign sources, a variety produced by one of the Wyoming companies was selected as best suited for the process, chiefly because of its higher yield of ultrafine, colloidal material. Although it is possible to produce Alsifilm of high tensile strength and also material that is flexible or even creaseproof, it has not been possible to obtain a high degree of flexibility without sacrificing the properties that render the material a competitor of mica.

Aside from fundamental laboratory research, quasi-commercial developments are now being conducted under cooperative arrangements with various companies. One of these companies is investigating the production of a cambric-type insulating tape impregnated with Alsifilm; another is working on a combination of Alsifilm with fibre glass, including both felted fibers and woven fabrics; and still other companies are directing their efforts to the production of substitutes for built-up mica sheet or board. Already commutator segments and other stampings have been made that appear to be acceptable substitutes for mica products. Large V-rings may also be produced, although the material does not seem at present to be universally suitable for molding plate. Experiments in the manufacture of heater plate are quite promising but are not far advanced as yet.

# LABOR DECISIONS

## Review

*American Federation of Labor et al. v. National Labor Relations Board,* decided by the U.S. Supreme Court, January 2, 1940; reported at 60 S. Ct. 300. The essential question for decision in this case was whether a certification by the National Labor Relations Board under Section 9(c) of the Wagner Act, that a particular labor organization is the collective-bargaining agent of the employees in a designated unit, is reviewable by a circuit court of appeals (specifically, in this case, involving longshore workers at various Pacific Coast ports, the Court of Appeals for the District of Columbia), by the procedure set up in Section 10(f) of the Act. The Court of Appeals held (103 Fed. (2d) 933) that such a certification was not reviewable, and the Supreme Court affirms that decision.

Section 10(f), providing for review, speaks only of a "final order of the board." It gives a right of review to persons aggrieved by a final order upon petition to a court of appeals "wherein the unfair labor practice in question was alleged to have been engaged in or wherein such person resides or transacts business, or in the Court of Appeals of the District of Columbia." It is evident (says the court) that the entire structure of the act emphasizes, for purposes of review, the distinction between an "order" of the board restraining an unfair labor practice and a certification in representation proceedings. "The statute on its face thus indicates a purpose to limit the review afforded by Section 10 to orders of the board prohibiting unfair labor practices, a purpose and a construction which its legislative history confirms." The act "provides for review in the courts only after the election has been held and the board has ordered the employer to do something predicated upon the results of an election."

Whether the provisions of the Wagner Act have foreclosed review of the board's action by independent suit in the Federal district court was not presented for decision, although argued by the board.

In a companion case, decided the same day (*National Labor Relations Board v. International Brotherhood of Electrical Workers et al.,* 60 S. Ct. 306), the Supreme Court makes a similar decision, that a direction for an election made by the board in a representation proceeding under Section 9(c) is not reviewable by a circuit court of appeals under Section 10(f). "The direction for an election is but a part of the representation proceedings authorized by Section 9(c) and is no more subject to review under Section 10(f) than is a certification which is the final step in such a proceeding," so that decision in this case is controlled by the other. In this instance the Circuit Court of Appeals (Sixth Circuit) had reached a contrary conclusion, and its decision (105 Fed. (2d) 598) is, accordingly, reversed.

## Procedure

*National Labor Relations Board v. Lane Cotton Mills Company,* decided by the U.S. Circuit Court of Appeals, Fifth Circuit, January 5, 1940; reported at 108 Fed. (2d) 568. The respondent company in this action sought to invalidate an order of the National Labor Relations Board on the ground that the board itself had not determined the matter, but had relied entirely on the report and findings of its subordinates, particularly the "reviewing section." The court refuses to interfere with the board's order. It is clear, says the court, "that the proposed findings, conclusions, decision, and order came either from the reviewing section or from the board itself. In either case, respondent was afforded an opportunity to appear before the board and present oral arguments, as well as to file briefs. The final order was that of the board itself. Under our former decision [*National Labor Relations Board v. Cherry Cotton Mills,* 98 Fed. (2d) 444], we may inquire as to the source of an order that purports to come from the board, where the record discloses no evidence that it did, and the circumstances indicate that it did not; but where, as here, there have been oral arguments and briefs before the board, and it appears that the case was withdrawn from this court in order that the board might act, there is no circumstance which would warrant our going behind the recitation of the order that it is made upon a consideration of the entire record in the proceeding."

## Relief

*Redlands Foothill Groves et al. v. Jacobs et al.,* decided by the U.S. District Court, Southern District of California, Central Division, January 5, 1940; reported at 30 Fed. Supp. 995. In this suit a group of coöperative associations sought injunctive and declaratory relief from rulings of the Administrator of the Wage and Hour Division of the Department of Labor which would make them subject to the wages and hours requirements of the Fair Labor Standards Act, whereas large competitive packing companies would be exempt from the operation of the act. On various grounds, particularly the failure to show that the defendants within the jurisdiction of the court had authority to institute proceedings against the petitioning associations, the court finds that it has no power to grant the relief sought.

## Jurisdiction

*Northrop Corporation v. Madden et al.; Aircraft Workers' Union, Inc., v. Nylander et al.,* decided by the U.S. District Court, Southern District of California, Central Division, August 18, 1937; reported at 30 Fed. Supp. 993 (March 4, 1940). This case arose on complaint for an injunction seeking to restrain the holding of an election to determine a collective-bargaining agent. Motions to dismiss are granted; the court finds that it has no jurisdiction of such a case, since the National Labor Relations Act does not contemplate court review of intermediate steps leading to an election to determine labor representation, and since the remedy of reviewing the actions of the board by the Circuit Court of Appeals, as provided in the act, is exclusive.

## Company Union

*National Labor Relations Board v. Norfolk Shipbuilding & Drydock Corporation,* decided by the U.S. Circuit Court of Appeals, Fourth Circuit, January 8, 1940; reported at 109 Fed. (2d) 128. This case arose on petition to enforce an order of the National Labor Relations Board. The questions involved were: (1) whether the board had jurisdiction, (2) whether the board's findings with respect to respondent's dominance of an interference with an employees' association (which the board ordered disestablished as a bargaining agency) were supported by substantial evidence, and (3) whether the findings as to the discriminatory discharge of a designated employee were so supported.

The first issue is decided with little discussion; the company is engaged chiefly in repairing and overhauling vessels which are used in interstate and foreign commerce, and a stoppage of its operations by industrial strife would result in substantial interference with the free flow of interstate commerce, according to the findings of the court.

On the second question it appeared that the employees' association was organized through the efforts of a supervisory employee, assisted by employees designated for such service by their foremen; the company permitted solicitation for membership during working hours; meetings were permitted on company property, and the company's stationery

and mimeographing machine were used. The association was organized shortly after an attempt to organize the employees by an outside union, whose organizers were not permitted to solicit members during working hours and were ordered off the premises. The company recognized the association as a bargaining agency for its employees immediately upon its organization without going to the trouble to ascertain whether or not it represented a majority. The court holds that all these facts furnish substantial basis for the board's finding that the company had interfered with its employees' right of self-organization.

Evidence on the question of the discriminatory discharge (the third question) was found not substantial, and that part of the order is reversed.

## Inside Union

*National Labor Relations Board v. Sterling Electric Motors, Inc.*, decided by the U.S. Circuit Court of Appeals, Ninth Circuit, January 9, 1940; reported at 109 Fed. (2d) 194. The National Labor Relations Board petitioned for the court's decree disestablishing an "inside union" of a majority of the employees of the respondent company. It thereby, in the language of the court, "seeks our frustrating their self-organized contract, evidenced in writing, creating their association as their bargaining agent, by ordering the respondent to cease and desist from recognizing it in collective bargaining. We are asked to take such action though none of the parties to the contract participated as a party to the board proceeding."

On a review of the record the court is unable to see that the evidence supports a finding of dominance of the association (the employees' inside union) or an interference with its affairs, or that there was substantial evidence of any unfair labor practice; the order, therefore, is set aside. Furthermore, the court rules that the employees' union could not be disestablished without notice and opportunity to be heard (of which there was none in these proceedings), which would be the denial of a civil liberty to the mechanics and their small association. The men making up a small inside union, says the court, have none of the protection and advice of the skilled labor organizers and counsel of the nation-wide federations and associations, and the court remarks on "how helpless these laborers there were to protect their association and the contract rights of each and of the association from their frustration and, in effect, destruction by disestablishment. In no class of trials is the presence of counsel for the parties sought to be deprived of their property more required than in these proceedings before the board." A particular danger to such associations is that pretended aid by the employer, after the free and independent organization of the association, "would place it in the power of any employer to disestablish a union to which it was opposed." The court consequently holds that the acceptance of an unsolicited benefit under such circumstances was not evidence of the association's "subservience."

# OCCUPATIONAL DISEASES AND THE LAW

## Fumes

*Huffman v. Cast Traffic Sign Corporation et al.*, decided by the New York Supreme Court, Appellate Division, Third Department, January 17, 1940; reported at 16 N. Y. S. (2d) 949. This was an appeal by the State Insurance Fund from awards for disability and death benefits made by the State Industrial Board. The claimant was employed by the Cast Traffic Sign Corporation as a molder from some time in 1935 to September, 1936. It was found that, in the month of July, 1936, he contracted tuberculosis superimposed upon a pulmonary fibrosis, and that he died therefrom on November 16, 1937; that the tuberculosis was the sole disabling factor and the primary cause of death, and that it was due to exposure to gas and fumes in his employment as a molder by the respondent company. The court holds that there was evidence to sustain these findings, and the awards for disability and death benefits on the basis of an occupational disease, within the preview of Section 3, Subdivision 2, Group 28 of the Workmen's Compensation Law. The awards are unanimously affirmed.

## Tuberculosis

*Grain Handling Company, Inc., et al v. McManigal et al.*, decided by the U.S. District Court, Western District of New York, January 18, 1940; reported at 30 Fed. Supp. 974. A workman employed as a scooper in the unloading of grain boats became disabled and subsequently died as a result of the aggravation of a tubercular condition due to his employment. A compensation claim was filed by and allowed to the widow under the Longshoremen's & Harbor Workers' Compensation Act, 33 U.S.C. § 901 et seq. The facts are so similar to those of *Grain Handling Company, Inc. v. Sweeney*, 102 Fed. (2d) 464, that the finding "is necessarily that deceased suffered from an occupational disease. The medical testimony adequately establishes the presence and advance of the disease, the casual connection with the employment and death resulting from such disease."

During the course of the employment the business of the Grain Handling Corporation, which was dissolved, was taken over by the Grain Handling Company, Inc., the main change being a difference in the stock holding; no notice of the change was given to the employees. Under the circumstances the failure of the claimant to name the Grain Handling Company, Inc., in the claim is held not to invalidate the claim. Similarly, the filing of the claim one day over the year allowed for filing claims is held not to defeat the claim since the company did not make timely objection. The court quotes from an appellate court decision, *Candado Stevedoring Corporation v. Lowe*, 85 Fed. (2d) 119, 121, "we think it important to have the right of workmen to compensation treated in a liberal spirit and only denied where some injustice or injury to the employer appears. The right of the employee should not be defeated by mere technicalities."

## Procedure

*Hodges v. State Compensation Commissioner et al.*, decided by the Supreme Court of Appeals of West Virginia, January 23, 1940; reported at 7 S. E. (2d) 24. This case involves a claim for workmen's compensation based upon an incapacity due to silicon dioxide poisoning contracted in the claimant's employment. The compensation commissioner made certain jurisdictional (non-medical) findings in favor of the claimant and ordered the claim referred to the Silicosis Medical Board for the medical findings listed under Code Section 23-6-14. From that order the employer attempted to appeal, and the Compensation Appeal Board reversed the commissioner's findings and dismissed the proceeding on the legal construction that Code Section 23-6-5 requires the claimant to establish that he was exposed to silicon dioxide dust in harmful quantities over a period of not less than two years in the same employment, *while employed by the same employer*. This appeal is held to have been error; the Supreme Court of Appeals rules that only a final order of the Commissioner may be appealed from (Code Section 23-5-3), and that the order referring the claim to the Silicosis Medical Board was not a final order. The case is accordingly remanded to the Compensation Commission for further proceedings, and the court does not pass upon the other legal questions raised in the proceeding.

# PERSONAL MENTION

W. P. Munger, formerly assistant designing engineer of the American Nepheline Corporation, Rochester, New York, has joined the Buffalo office of Joseph T. Ryerson & Son, Inc., and is connected with the reinforcing-bar department.

Frank Hinline of the Camden Lime Company, Camden, New Jersey, has been reëlected a director of the New Jersey Motor Truck Association.

Hayes Parsons has been advanced to sales manager of the Link-Belt Speeder Corporation. For the past several years, Mr. Parsons has represented Speeder Machinery Company—and (after the consolidation), Link-Belt Speeder—in the Seattle district.

George R. Huffman for the past three years advertising manager of R. G. LeTourneau, Inc., Peoria, Illinois, resigned March 15 to return to the Pacific Coast.

George C. McNutt

George C. McNutt, formerly associated with the Bert S. Gittins advertising agency as account executive on Allis-Chalmers, Bucyrus-Erie and other industrial accounts, has assumed his former position as advertising manager of R. G. LeTourneau, Inc. Mr. McNutt fills a position vacated by the resignation of George R. Huffman, who has gone to the Pacific Coast.

Hubert Ferguson is in charge of the installation of a new sand-and-gravel plant on the Trinity River near Malakoff, Texas, for the J. W. Hartman Company.

E. R. Gustafson, traffic manager of the Universal Atlas Cement Company, has been elected president of the Traffic Club of Chicago, comprised of 1,500 traffic executives. He succeeds W. C. Douglas, assistant general freight traffic manager of the New York Central system.

J. D. Fletcher, export sales manager, and T. R. Farley, assistant to the president, have been elected vice-presidents of Caterpillar Tractor Co.

W. J. Bremer has gone into the ready-mixed-concrete business at Savannah, Georgia. Four truck mixers are serving the batching plant.

E. H. Frickey, president of the Dixie Machinery Company, St. Louis, died April 5.

H. Worthley Webb, secretary-treasurer of the Columbus Slate Company, Columbus, Ohio, died recently.

George H. Hall, secretary and sales manager of the Cleveland Rock Drill Company and one of the founders of the concern, died at Lakeside Hospital, Cleveland, on March 7, of a lingering illness.


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## FOREIGN DEVELOPMENTS

### Testing of Gravel for Organic Impurities

Gruen and Schlegel explain that a method for testing sand for organic constituents,' which originates from Abrams and Harder, is used frequently in Germany in its original American form to discover whether the sand contains organic impurities and accordingly is unsuitable for concrete. In this method 130 cubic centimeters of aggregate is placed in a graduated 350-cubic centimeter flask, 3 per cent. of caustic soda is added to the 200 cubic centimeter line, is shaken well and allowed to stand for 24 hours. The American table indicates that a sample showing a dark brown-red color is unsuitable for concrete, assuring 50 to 100 per cent loss in compressive strength for mortar samples. The authors, however, determined that sands which color the caustic soda a dark brown-red result in very good mortars and concrete. Therefore, investigations were made on many sands and gravels, both natural and prepared, which appeared unsuitable when tested by this method. The strengths of concrete and mortar specimens made with the specimen aggregates are reported in detail, and conform to previous findings. It is concluded that the caustic-soda method for sand-and-gravel testing can merely be designated as a caution method. For the judging of a sand or gravel in reference to its applicability for concrete production only the test for compressive strength and for imperviousness to water of the concrete made with it is decisive. When contaminated gravels are to be used, comparative tests may be made with washed gravels.—*Steinbruch und Sandgrube,* vol. 38, No. 11 (June 5, 1939, pp. 175-176; No. 12 (June 20, 1939), pp. 187-188.

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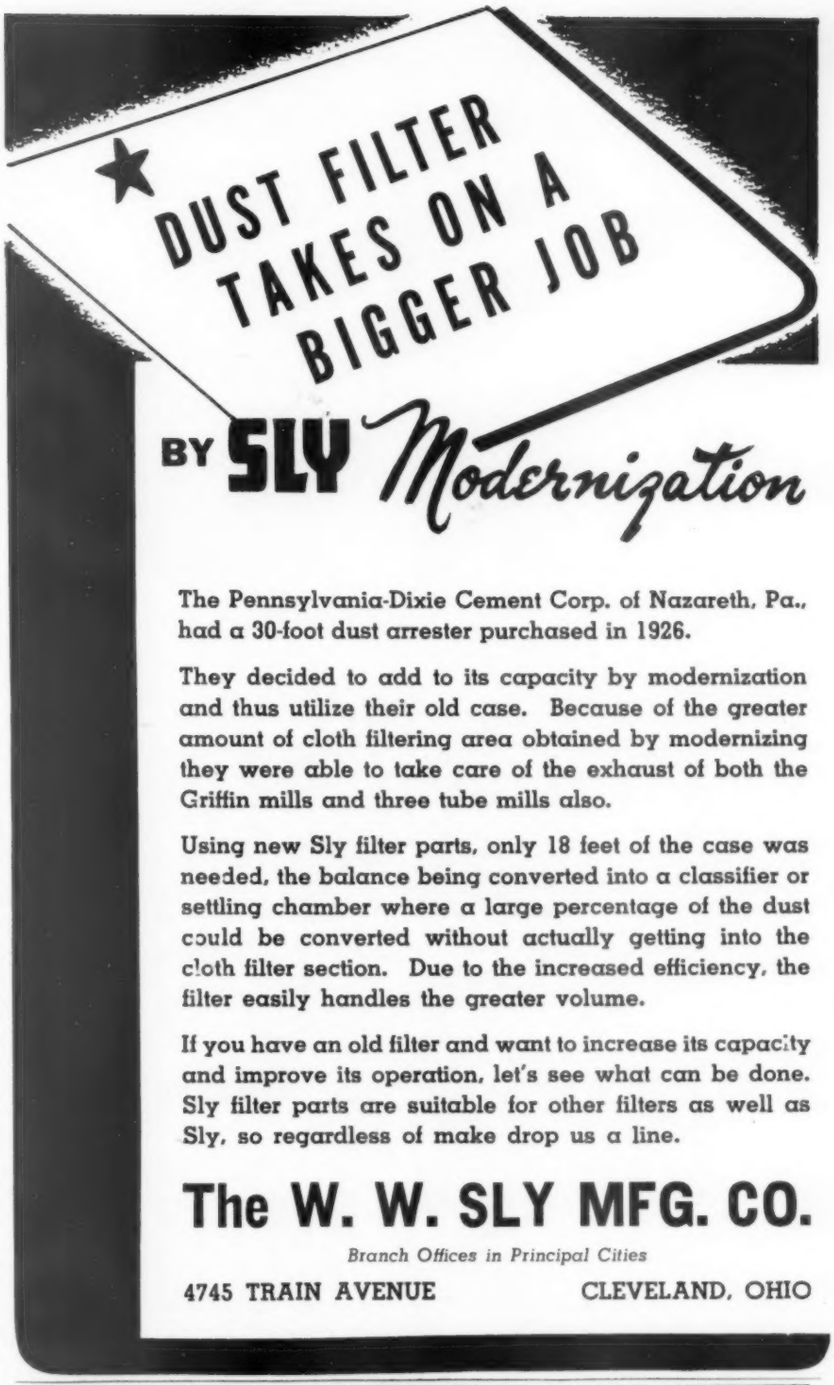
### Microscopic Examination of Lime Hydration

O. E. Radczewski, H. O. Mueller and W. Eitel report from K. W. Institute for Silicate Research, and from the Laboratory for Electron Optics of the Siemens & Halske A. G. that in the setting of cement and in the hydration of cement clinker minerals an important hydration product, calcium hydroxide, $Ca(OH)_2$, is formed. Its starting material is not so much the free lime, CaO, found only in very small quantities in a good Portland cement, but rather the principal clinker material, tricalcium silicate, $3CaO.SiO_2$, which in the reac-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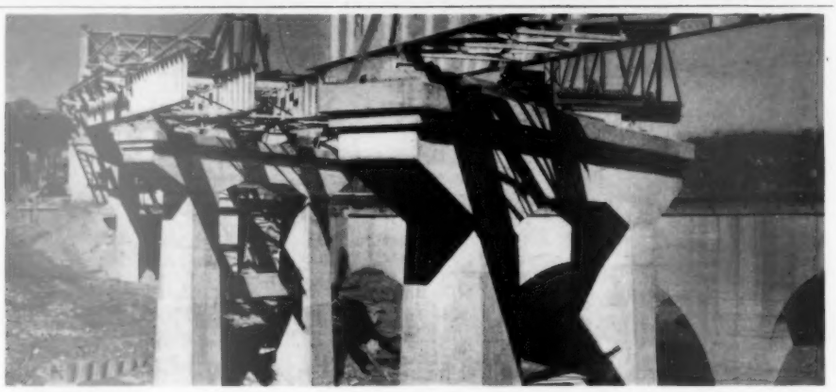

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tion with water during hydrolysis splits off calcium hydroxide:

$$3CaO.SiO_2 + aq \rightarrow Ca(OH)_2 + CaO.ySiO_2.q.$$

Calcium hydroxide being produced hereby in large quantity, the hydration of calcium oxide was examined with the Siemens super-microscope of Ruska and von Borries.

A finely granular calcium carbonate preparation of Schering-Kahlbaum precipitated for silicate analysis after Lawrence-Smith was used, elutriated, after grinding, to $< 1\ \mu$ radius burned about 2 hours at low temperature of 650 degrees C. to avoid strong re-crystallization and in a vacuum of 15 to 17 millimeters mercury to expel all carbonic acid, and then suspend at once in xylene and in isobutylalcohol in the exsiccator. The burned lime is irregularly granular and in general the granules are of 50 to 500 m$\mu$ size.

Various solutions of the calcium hydroxide were then prepared for the super-microscope and examined. Ten slides are shown, in magnifications ranging from 9,000 to 200,000, and the observations are described.—*Zement,* vol. 28, No. 49 (December 7, 1939), pp. 693-697.

## Compressive Strength of Concrete Pipe

Fritz Weise reports on investigations made at the Stuttgart Material Testing Institute, with the conclusion, on partly completed investigations, that it is expedient to make the wall of concrete pipe thicker at the crown and at the base than at the sides. He relates that many circular concrete pipes made in Germany and Switzerland still have a uniform wall thickness unlike those in Denmark, Sweden and the Netherlands. For example, round pipe of 500 millimeters diameter has a wall thickness of 55 to 65 millimeters in Germany, 60 to 65 millimeters in Switzerland; and in Denmark 78 millimeters at the crown, 129 millimeters at the base, and 66 millimeters at the sides; and in the Netherlands 90 millimeters at the crown, 70 millimeters at the base, and 65 millimeters at the sides.—*Zement,* vol. 28, No. 52 (December 28, 1939), pp. 734-737.

## Bending Strength of Dry-Stored Mortar

R. Gruen discusses the water demand of cement during hardening, the shrinkage tendency of cement mortar, the water release during hardening, and results from cement in field applications. He concludes that the testing for bending strength of specimens which are dried out and therefore exist in tension, and in which the cement moreover hardens in a manner never occurring in

practice, should be rejected since too many factors, which can not be excluded and make the figures obtained useless, affect the work.—*Zement,* vol. 28, No. 50 (December 14, 1939), pp. 709-712; No. 51 (December 21, 1939), pp. 721-725.

## Determination of Solidification Procedure

Dr. Keil reports from the research institute of the German Association of Iron Portland Cement Plants regarding the increase in stiffness of concrete, and regarding experiments with cement paste, with cement mortar, and with concrete. The procedure of solidification of cement, cement mortar, and concrete can be ascertained through the determination of the volume of water required at certain time intervals for restoring the starting stiffness of the specimen. The curves of water demand of cement, mortar and concrete conform well with each other. The cement paste of standard stiffness and the cement mortar with mixed granules in accordance with German Industrial Standard DIN 1165/66 give only that increase in stiffness which originates from the water binding of the cement; but the concrete gives also the increase in stiffness conditioned by the behavior of the aggregate. Therefore, the behavior of the cement can not be concluded clearly from the determinations on concrete. By comparing the solidification procedures of pure cement or standard mortar with those of concrete subject to all conditions prevailing on a construction job, as, for example, conditions of aggregate and weather conditions, attention is brought more than it has been formerly to the fact that many variations in stiffness occurring during the handling of concrete, which have been erroneously considered as conditioned by the cement, are to be traced actually to conditions of the aggregate.—*Zement,* vol. 28, No. 52 (December 28, 1939), pp. 729-732.

## Behavior of Cement in Boiling Water

F. Keil and F. Gille report from the Research Institute of the Association of German Iron Portland Cement Plants. The shrinkage test of plastic mortars, based on the German Industrial Standard DIN 1165/66, needs improvement in two directions. On one hand its resulting values do not conform with determinations in concrete, and on the other hand the determination of the shrinkage values requires too much time, as has been pointed out elsewhere. A series of tests are made by placing specimens of cement in boiling water and the results are reported in detail.


# EVERY STEP

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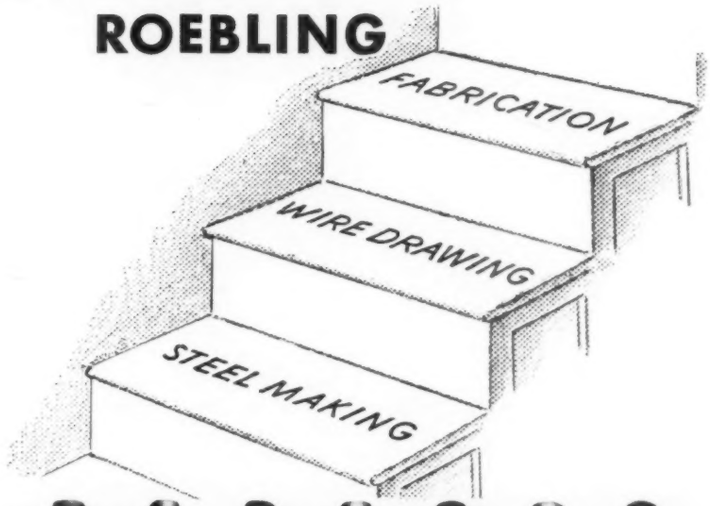


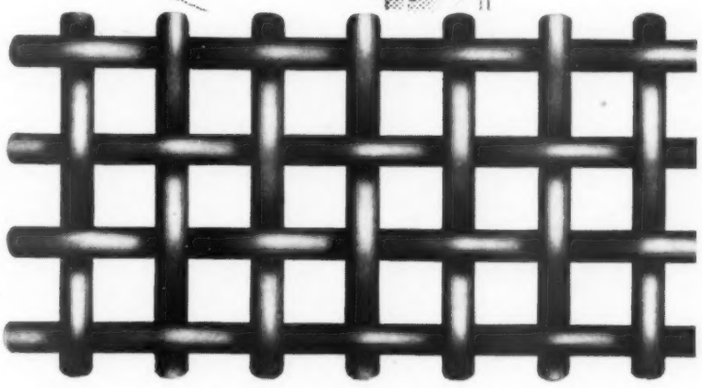

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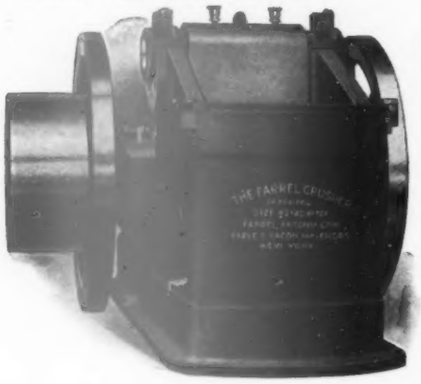

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The results of boiling-water treatment in place of 7-day water storage are so irregular that a shortening of the existing standard shrinkage test is impossible. Other results are unfavorable and more information is to be reported.—*Zement,* vol. 29, No. 3 (January 18, 1940), pp. 28-31.

## Comparative Studies of Lime Mortars

Dietrich investigated ground slaked lime specimen A containing 62.5 per cent CaO, B 66.2 per cent, C 52.5 per cent, D 57.0 per cent; and ground burned lime specimen E 86.2 per cent, and F 69.5 per cent, using about a dozen different lime-sand mixes for each specimen. Test conditions are described and the test results are presented in elaborate tables. It is proved that extensive soaking-pit storage (7 days) of ground slaked lime does not increase the yield and pliability of the lime above that obtained in several hours' (24) storage of prepared mortar. Studies of the mortar yield of the various specimens indicate considerable fluctuation in yield and suggest that lime producers so direct their burning procedure and the slaking process that the product will show a maximum of mortar yield. It was verified that a larger quantity of sand can be admixed in ground burned lime than in mixing proportions determined with slaked-lime mortars, in order to obtain the same workability and pliability; the disadvantage of the ground burned lime exists in the limited storage ability, which of course can be overcome in part by packaging in bituminized paper sacks.— *Tonindustrie-Zeitung,* vol. 64, No. 2 (January 10, 1940), pp. 11-12; No. 4 (January 20, 1940), pp. 24-26.

## Static Investigation of Rotary Kiln

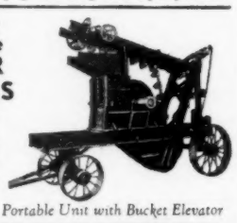
Ernst Rock presents, on the basis of static investigation, the approximate requirements for the proper dimensioning of the various parts of a straight rotary kiln. He gives due consideration to the various forces and temperatures encountered in kiln service; and in calculating regards the kiln tube as a rigid-supporting horizontal non-rotating element assuming elliptical form due to lining, clinker load, etc. His calculations are based on the Clapeyron equation as used by Kersten. Diagrams and figures support the text. — *Tonindustrie-Zeitung,* vol. 64, No. 8 (February 10, 1940), pp. 47-48; No. 9 (February 17, 1940), pp. 55-57.

The Robins Conveying Belt Company has moved its offices from New York City to Passaic, New Jersey, where its factory is located. The executive, engineering and sales departments are housed in a new three-story brick building only recently completed.

IT COSTS NO MORE TO USE THE BEST
REPLACE WITH
"Indian Brand"
MANGANESE STEEL
LONG LIFE ABRASION RESISTING PARTS FOR QUARRY, ROAD, DREDGING, AND MINING MACHINERY
The Frog, Switch & Mfg. Co. CARLISLE, PA.
ESTABLISHED 1881

LOW COST CRUSHING FOR 55 YEARS
GRUENDLER TWO-IN-ONE
LIMESTONE PULVERIZERS
Paying Big Dividends
Built to withstand severe punishment
- Heavy Duty Manganese Hammers
- Roller Bearings for 100% Overload
- Heavy Cast Steel or Sheltalog Construction
- Adjustable Breaker Plate, Single Part Manganese Screen Bars
- Lowest Power and Maintenance
- Largest Capacity per H.P.

you can depend on
GRUENDLER EQUIPMENT
Write for our 16-page Catalog and Specifications
Stationary or Portable HAMMER CRUSHERS
Ideal for farm to market road work. Crushes stone to 1" minus down to agricultural lime dust.



Portable Unit with Bucket Elevator
GRUENDLER
CRUSHERS · PULVERIZERS · GRINDERS
GRUENDLER CRUSHER & PULVERIZER CO.
2915-21 N. Market St., St. Louis, Mo.

## NEW MACHINERY AND SUPPLIES

### • *Testing Screen*

The Gilson testing screen has been designed for the efficient sizing of test samples of crushed stone, gravel, slag and similar materials.

A starting switch with overload relays, the ¼ horsepower capacitor-type motor, and the roller- and ball-bearing driving mechanism are mounted on a rigid electric-welded outer frame. This frame, inclosing sides and back of the vibrating unit, counterbalances vibration so that the operation is smooth and quiet. The vibrating unit is suspended on four springs and centered top and bottom in the outer frame. It is claimed that, when the machine is properly levelled, it can not get out of alignment.

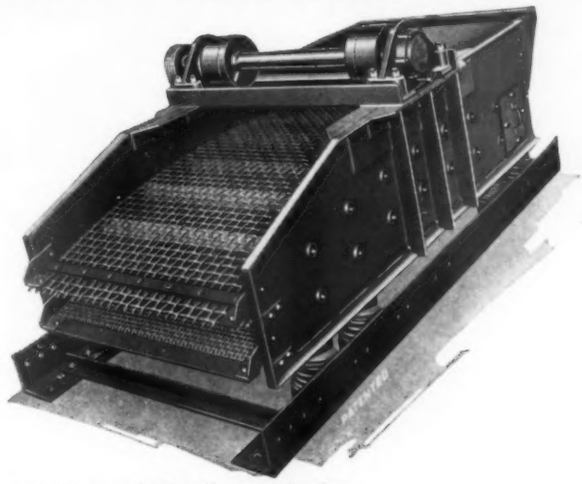
The vibrating unit consists of a number of interlocking spacers which support and separate the screen trays. The equal clearance between trays permits a clear view of the operation and the independent removal of each tray. The unit holds five screen trays and dust pan; an additional screen tray may be added by placing dust pan on floor under the unit. If fewer separations are required, one or more screen trays may be left out if desired. Two or three turns of the tightening rods (seen at top of illustration) securely fastens or releases all trays. Thus vibration is evenly distributed throughout all screen trays when in operation.

The screen trays and dust pan are built to withstand hard usage. All trays and dust pan are balanced to same exact weight, and this serves to eliminate need of transferring the sample before weighing. Screen wire (ASTM standards) is held under tension by a tightening arrangement which insures proper vibration, prevents sagging and permits easy replacement. A simple device enables adjustment of tray weight when replacement of screen wire becomes necessary.

The Gilson testing screen accommodates up to 100 pounds of sample, making from two to seven separations simultaneously, in five minutes or less. It is manufactured by the Gilson Screen Company, Mercer, Pennsylvania.

Testing screen for analyzing aggregate sizes.


**DEISTER**
**PLAT-O VIBRATING SCREEN**



1. Powerful high-speed vibrating mechanism.
2. Screen cloth automatically held under uniform tension.
3. Any one screening surface changed without disturbing remaining decks.
4. Cushioned vibration.

**DEISTER MACHINE CO.**
1933 E. WAYNE ST. FT. WAYNE, IND.
Canadian Licensee and Manufacturer:
Manitoba Bridge & Iron Works, Ltd., Winnipeg

**JOBS DON'T COME TOUGHER THAN THIS ONE!**

● This Williams ½ Yard Multiple Rope Bucket took plenty of punishment on this job—tearing out the massive stone and concrete foundations of the old Baldwin Locomotive Works in Philadelphia. Wm. Geppert, Inc. are the contractors.

● The digging power in Williams design and the rugged durability of their welded rolled steel construction make Williams Buckets profit producers for contractors everywhere.

Bulletins describing all types of Williams Buckets sent FREE on request.

**THE WELLMAN ENGINEERING CO.**
7014 Central Ave., Cleveland, Ohio

**WILLIAMS *Buckets***
***built by* WELLMAN**

A Laughlin drop forged Safety Clip takes hold of wire rope with a sure, solid grip — just like a fist. It's no rope crimping "finger pinch," but a rugged vise-like hold. Tests have proved Laughlin Safety Clips twice as efficient as ordinary "finger pinch" U-Bolt clips.

**SAVES WIRE ROPE.** There's no bowing or distortion of wire strands in rope secured with Laughlin Safety Clips. So — no wire has to be discarded after Safety Clips are removed — with a resultant saving to you.

**FASTER TO APPLY.** Laughlin Safety Clip nuts are on opposite sides — easy to get at. Two wrenches can be used at once — you save lots of time clipping rope this *modern* way.

Write for free booklet describing many money-saving features of Laughlin safety clips. Also gives results of recent tests by a great engineering school, proving Laughlin Safety Clips 50% more efficient. Fill out coupon — today.

**THE THOMAS LAUGHLIN CO.**
**Portland, Maine**

Please send me free Safety Clip booklet. P4

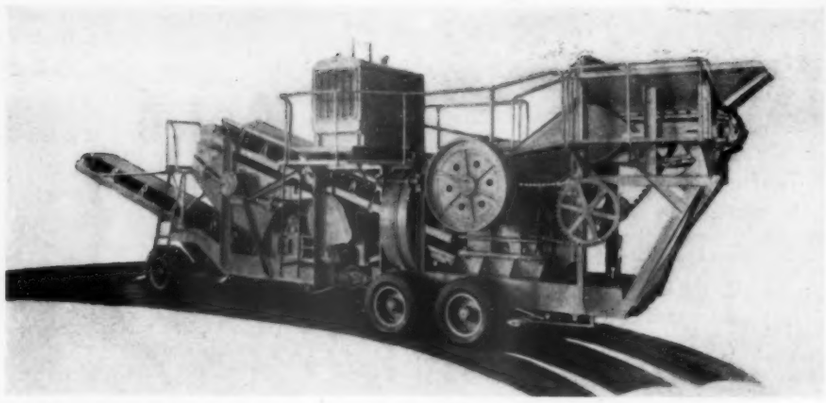
Name .....

Company .....

Address .....

Check here for catalog on items below ☐

Look for Laughlin products in Thomas' Register and buy through your distributor.



New portable crushing-and-screening plant.

## • Portable Plant

This new Diamond Iron Works portable quarry plant receives rock direct from the quarry shovel dipper to the receiving hopper. An apron feeder with manual control discharges over a grizzly, oversize going to a jaw crusher; the undersize is by-passed to the belt-conveyor passing under the jaw crusher.

The jaw crusher also discharges to the belt-conveyor. This conveyor delivers all material to the large vertical rotor-lift that elevates the product to the main conveyor for delivery to the 4- by 8-foot single deck Diamond vibrator screen.

Sized material passes the screen to the hopper below that feeds the delivery belt conveyor. Oversize is discharged to a roll crusher and carried back by a belt conveyor to the vertical rotor-lift for recirculation over the screen. The plant can be equipped with a double- or triple-deck screen, and chip eliminator, when desired.

The outfit is equipped with dual pneumatic tires and mechanical brakes. It is a self contained unit driven by a 90 to 100 horsepower Diesel engine mounted overhead, or from an auxiliary engine.

## • Wire-Rope Clip

A new wire-rope clip has recently been put through competitive laboratory tests. According to the manufacturer, the Thomas Laughlin Company of Portland, Maine, the tests indicate a 20 to 30 per cent. increase in holding power and a marked lessening of rope distortion.

This new product does not materially modify the fundamentals of clip design which have long prevailed in the industry. Results are attributed to a few simple features: bolts and identical bearing surfaces on opposite sides equalize the pressure on the rope.

The new clip contrasts with the "U-bolt" clip which has both nuts and a single flat bearing-surface saddle on one side. Care must be exercised in placing the saddle of the "U-bolt" against the working part of the rope.

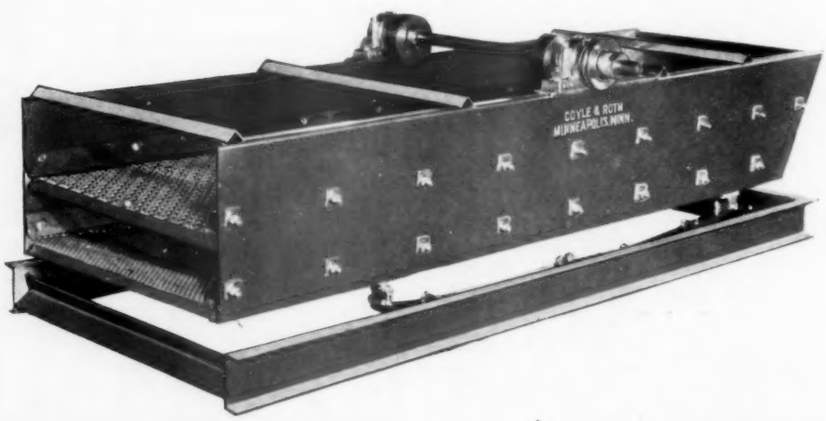
Ease of application, fewer accidents and savings in rope are among the advantages claimed by the manufacturers of the new safety clip. Insurers and wire-rope manufacturers have reputedly taken a pre'iminary interest in these accident-preventing and rope-saving features.

A new folder, just off the press, fully describes the competitive tests in which the "Safety" clip consistently out-held the U-bolt clip.

## • Loader

With trucks on pneumatic tires, quarry storage floors and material yard floors are to-day so generally kept in smooth condition that the George Haiss Manufacturing Company has designed a highly mobile, wheel-mounted loader for stock-pile service.

The new Haiss loader is designated as Model 75W and will handle up to 3 cubic yards a minute. This gives it capacity to put up a quick load in the big trucks for which its 10-foot discharge-chute clearance was designed. The wheel mounting is on 7- by 20-inch heavy-duty tires, with dual wheels in the rear. The front axle assembly and steering gear follows automotive practice and uses standard heavy-




**The Companion, a new multiple-deck vibrating screen recently placed on the market by Coyle & Roth, Minneapolis. The vibratory action is variable, adapting the amplitude of vibration to the material being separated. Low power consumption is said to be a feature.**

Highly mobile, wheel-mounted loader.

duty truck parts. All wheels are on Timken roller bearings, and wheels and tires are interchangeable throughout. Traction drive is from a differential countershaft by roller chain to the rear wheels.

The Model 75W is powered with a 35 horsepower, 4-cylinder Waukesha motor driving through a transmission gear set designed and built especially for loader service. The digging-and-loading mechanism follows traditional Haiss design, with the characteristic revolving-propeller self-feeding device and tooth-edged buckets. A clean-up scraper, hung from the elevator boom, is close set behind the feeding paddles and obviates the need for hand shoveling to clean up the ground. The operator is in complete control, raising and lowering the digging end of the elevator through a hand wheel and worm gear mechanism acting on the balance-pivoted elevator.

The accompanying photograph was taken in Ohio when the temperature was 20 degrees F., and the loader was required to break through a 10-inch frozen crust on the gravel pile.

## • *Air Hose*

Designed especially for heavy-duty pneumatic-tool service is the Goodyear Tire & Rubber Company's new Red Wing air hose. Introduced by the company's mechanical-goods division (Akron, Ohio) Red Wing air hose is comprised of three principal components.

The tube is of non-porous rubber, resistant to action of hot and cold air. Lubricants in

Temperature-resistant air hose of nonporous rubber.

the air will not cause swelling or flaking, obviating clogging of tools with rubber particles.

Reinforcement is provided with three plies of multiple-braided, special cabled cotton yarn, providing a high safety factor for working pressures and high resistance to blows and impacts.

The cover is of heavy-gage soft, red rubber


# WE GAVE PIPE *a new twist*

WE gave it this new twist a long time ago. It was the spiral twist—and it proved to be a revolutionary idea. The spiral seam gave light wall pipe greater rigidity and strength than it had ever had before. Year by year we have improved it—strengthened the seam; developed protective coatings for all services; broadened the range of sizes, wall thickness, and joints.

FOR your dredging lines, pontoon lines, sand and gravel lines, water lines and all similar services, this time-tested, but ever-modern pipe will handle the job at half the installed cost of any other type of pipe that you could use.

TAYLOR FORGE & PIPE WORKS

General Offices and Works: Chicago, P. O. Box 485—New York Office: 50 Church Street

TAYLOR

Spiral PIPE

ASK FOR CATALOG 36

Universal 1836 and 936 Jaw Crushers, and 20 x 40 double corrugated rolls make profits for this operator near Hot Springs, Ark.

# *Another* UNIVERSAL *Quarry Plant!*

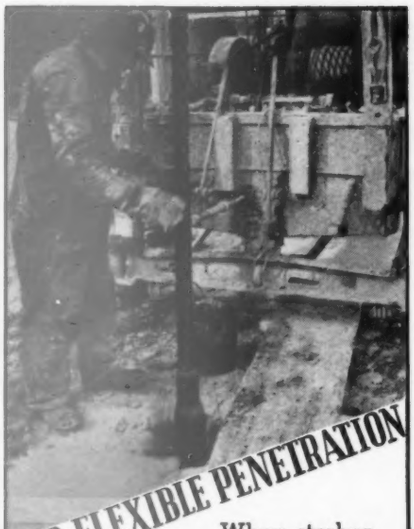
This Universal designed and equipped plant turns out 700 tons of crushed rock daily that will pass a 7/8" screen. Entire plant is operated by a 6 cylinder diesel. Universals are way ahead in economy of operation, low power and maintenance costs and, per dollar invested in equipment, they provide the greatest yardage return—whether it's a stationary or portable Universal Rock or Gravel Plant, or a Universal Crusher or Pulverizer. Ask for proof—we have it!

*Write for new catalog.*

UNIVERSAL CRUSHER COMPANY

619 C AVENUE WEST — CEDAR RAPIDS, IOWA

UNIVERSAL



FOR FLEXIBLE PENETRATION

When strokes per minute mean dollars earned per hour—Safeguard expensive equipment from costly shut-downs with FITLER "Philadelphia" Manila Drilling Cable.

*Look for the Blue and Yellow Colored Yarn Trademark*

**DRILLING CABLE**

THE EDWIN H. FITLER CO.
PHILADELPHIA, PA.
Established 1804


with high tensile strength, providing utmost resistance to cutting from rocks, ore, or other materials. It likewise is abrasion and sun-resistant. The hose is available in ½-inch, ¾-inch and 1-inch sizes.

## • Motor Truck

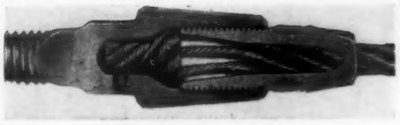
Insistent demand for a short-coupled, medium-weight all-wheel-drive truck to be used for semi-trailer work have been answered in the standard Ford101-inch wheelbase cab-over-engine model, converted to all-wheel-drive in the Marmon-Herrington factory at Indianapolis.

The extraordinary maneuverability of this vehicle is instantly apparent. The short wheelbase provides an unusually short turning radius. All-wheel-drive traction and power give the ability to climb exceedingly steep hills and grades and insure performance in soft or slippery footing which would stall any conventional rear wheel drive vehicle. Normal front wheel placement (as compared to front end overhang in other makes of multiple drive vehicles) gives a greater approach angle for getting in and out of ditches, excavations, etc., without "rooting." Cab-over-engine design permits better load balancing, more uniform traction and less tire wear.

All-wheel-drive truck for semi-trailer service.

This model, like all other Marmon-Herrington all-wheel-drives, is equipped with constant velocity joint steering ends, which take the "fight" out of the steering wheel, and provide easy, finger-tip steering control under all conditions. All-Wheel-Drive traction minimizes wheel slipping and skidding, and the front wheel traction helps to bring the vehicle quickly and safely back onto the road, if it should get off onto soft shoulders. The danger of "jack-knifing" is greatly minimized.

The Marmon-Herrington line now comprises conversions of all standard Ford trucks, passenger cars and commercial cars to all-wheel-drive, and a complete series of "heavy-duty" all-wheel-drive trucks and truck-tractors with gross capacities up to 70,000 pounds.

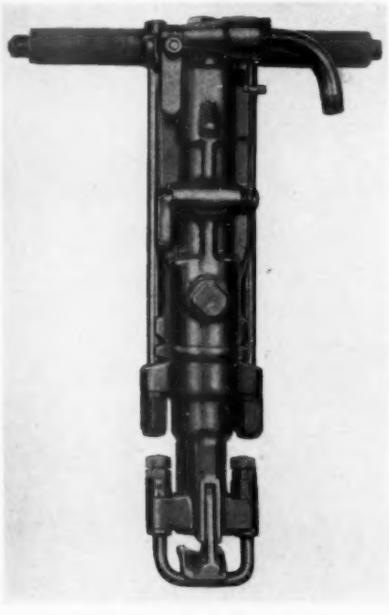


**Electroline-Fiege fittings are remarkably compact assemblies of three simple units—a sleeve which slips over the end of the wire rope, a plug which is inserted to separate and hold the strands of wire in the sleeve, and a covering socket which locks the cable to make a flexible, long-lived connection. No heat nor hot metal, no welding nor elaborate equipment is needed to make this permanent attachment. They are reclaimable and can be used over and over. They can be supplied for every type of connection by the Electroline Company, Chicago.**

## • Sinker Drill

Described as a sinker to fill the need for a drill in a size between the widely used 55-pound type and the heavier machines weighing 75 to 80 pounds, a new 67-pound sinker, known as the S-73, has just been announced by the Gardner-Denver Company.

The four-pawl rotation feature, which has proved successful in other Gardner-Denver



Medium-weight sinker drill.


● At its price—the lowest in Telsmith history—the Intercone is the greatest crusher value in years.

Intercone crushing is the fast, *low cost* way to turn out large tonnage of ½ to ¾-in. rock—the way to increase, not only your production, but your sales and profits.

The 25 Intercones, already in successful operation in various plants throughout the country, prove it!

**LOWEST PRICE**
**Crusher *in***
***Telsmith History***

*Write—it will pay you to get facts and figures on Intercone's modern design and low cost operation features.*

**SMITH ENGINEERING WORKS**
504 E. CAPITOL DRIVE
MILWAUKEE • WISCONSIN

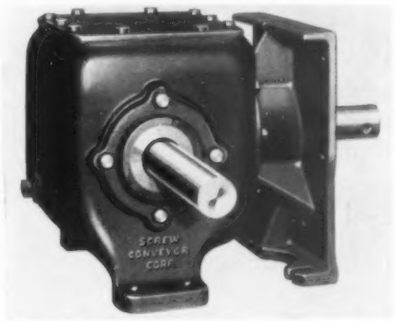
**TELSMITH**
***INTERCONE***

drills, is incorporated in the S-73. The pawls are reversible for double wear. The valve design allows unrestricted admission of air with an extremely short valve stroke. The drop-forged cylinder has a bushing with renewable bronze liner. The chuck end is drop forged and is available in any style. A large oil reservoir surrounds the cylinder bushing and feeds oil automatically to all working parts of the drill. The sinker has ¾-inch side rods of special stock, with long cap nuts to protect the thread.

### • Box End Unit

To bring power losses in the operation of screw-conveyor systems to an absolute minimum as well as to provide utmost protection from fires and other accidents common with exposed gearing, the Screw Conveyor Corporation, 727 Hoffman Street, Hammond, Indiana, has introduced the "Ace", a new one-piece inclosed anti-friction counter-shaft box end, considered a revolutionary improvement in elevating and conveying equipment.

The unit houses both gears and bearings, is completely sealed from dirt and dust, as well




Improved box end unit for screw-conveyors.

as being absolutely oil-leak-proof. Its Timken roller bearings carry all thrust and radial loads, eliminating the need of a separate thrust bearing. The box end is interchangeable with all old types and is designed with a safety factor considerable in excess of normal horse-power requirements. Compactness in design and neat proportioning avoids excessive size and weight, also reducing installation costs.

It can be furnished for wood or steel boxes in 6, 9, 10, 12, 14, 16 and 18 inch sizes, with mitre or 2-to-1 ratio bevel gears.

### • Excavator

The Osgood Company, of Marion, Ohio, announces the Type 90, a new member of its line of excavators.

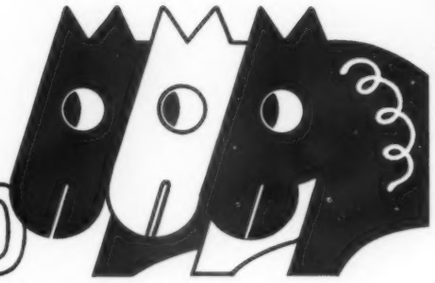
The Type 90 is a rugged, heavy-duty excavator, noteworthy for its simplicity of operation, its mechanical perfection and its operating efficiency. It is available as a shovel, with varying lengths of booms and handles and dippers up to 2½ cubic yards capacity, and with drag-line equipment up to a 85-foot boom and a 2-cubic yard bucket, with larger buckets on shorter booms.

The main-deck casting is a large, unit-steel casting, with all machinery mounted in unit cast-steel side frames, carried on machined pads. Side frames keep all shafts and gears in perfect alignment.

The machine is powered by gasoline, oil, Diesel, or electric motor. Power is transmitted from the engine or motor to the countershaft by a fully-enclosed Morse silent chain. The power take-off clutch is of disk type.

Swing and travel gears are ball-bearing mounted, and controlled through wide faced,

TRIPLE-POWERED

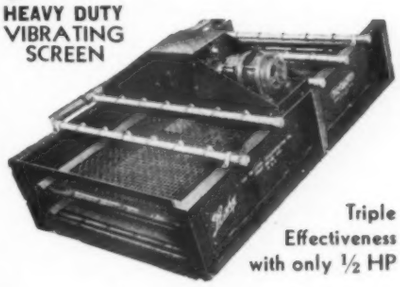


Capacity, Uniformity, Economy . . . are the "Big Three" of modern screening . . . and all are made maximum by the Tri-Vibe principle now built into the new LEAHY Type C No-Blind Vibrating Screen. This booster-feature *triple powers* the free-swinging screen jacket with the dynamic LEAHY differential vibration of the improved Heavy Duty Vibrator. By keeping the meshes clear, it increases capacity . . . by distributing the vibration . . . it maintains uniformity. Use this latest type LEAHY to reduce your costs of *fine screening!*

Ask for Bulletin No. 14-H.

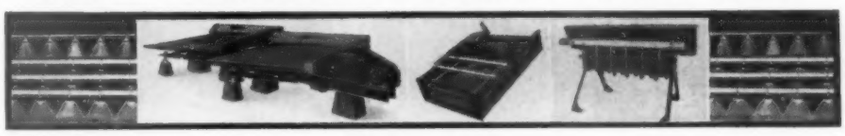
THE DEISTER CONCENTRATOR CO.
The Original Deister Co., Est. 1906
911 Glasgow Ave. Fort Wayne, Ind.

THE Leahy WITH TRI-VIBE
HEAVY DUTY VIBRATING SCREEN

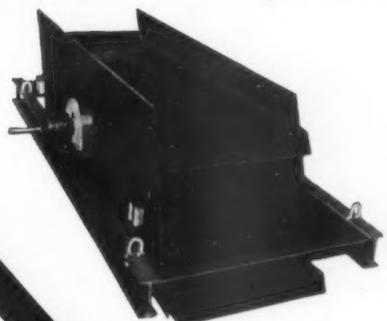


Triple Effectiveness with only ½ HP

Spray Nozzles • Duplex Washing Tables • Leahy Screens • Constriction Plate Classifiers

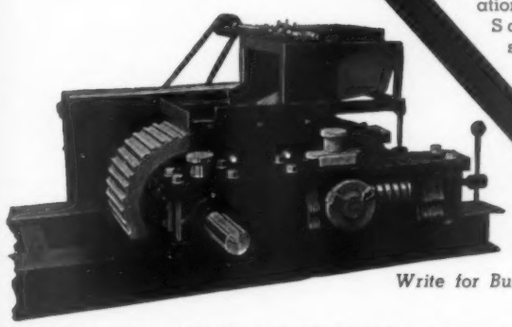


NEW HOLLAND Vibrating Screens



Roll Crusher with new Pulsating Feeder gives extra high capacity in reduction of 3" material down to sand fineness. Full range of sizes up to 100 tons per hour.

New, Circle Throw Screening Action insures a *better* deal in grading—sets the high marks in capacity, uniformity of product and thrifty operation. Heavy Duty Screen built in six sizes, one to three decks.



*Write for Bulletins*

NEW HOLLAND MACHINE CO., New Holland, Pa.

large diameter contracting band clutches. The crowding and retract unit is self-contained and bolts to the main deck casting.

The hoisting drum assembly has wide-faced spur gears, machine-cut from blanks. They run quietly and are easy to lubricate. The drum shaft is extra heavy, and is anti-friction bearing mounted. Drums are cast steel with demountable semi-steel lagging for various classes of work. Clutches are set by Osgood "Servo Mechanism," insuring smooth, quiet and efficient operation. Machinery is so arranged on the deck that it is easy to get at and to make adjustments. All controls are led to the left front of the cab. Swing and travel clutches, and swing brake are controlled by vacuum. They are easy to set, and reduce fatigue and effort for the operator. The cab is all steel, with sliding doors and windows. The operator has clear vision in all directions, and all-weather protection.

### ● Belt Fastener

For joining the thin, light-weight conveyor belts that are growing more popular, the Flexible Steel Lacing Company, Chicago, has added a new size to its line of Flexco HD belt fasteners. This new size is known as No. 1¼ and is used for joining elevator and conveyor belts from 5/16 to ½ inch thick. The holding bolts are large size, yet, because of its short length, the new fastener will travel around pulleys as small as 14 inches in diameter.

The new No. 1¼ is constructed and applied in the same fashion as the other Flexco HD fasteners. Metal plates span the joint on opposite sides of the belt and are drawn tightly together by two bolts through the belting. Bolt heads and nuts are countersunk and the protruding bolts are broken off; the fasteners are flat and smooth on both sides.

The fastener makes a tight butt joint. A template locates the bolt holes slightly farther apart than the bolt centers of the fastener; when the bolts are inserted and drawn down into position the belt ends are forced together tightly, forming a compression seal that will not let material sift through. The completed joint, since it is a series of separate fastenings, can assume the trough of the conveyor as naturally as the rest of the belt.

### ● Excavator

A new ½-cubic yard convertible excavator, Model LS-60, is announced by the Link-Belt Speeder Corporation, Chicago.

Claimed for this new model are several advancements, which include self-aligning roller bearings on drum shafts, reverse shaft and main power shaft; a new safety-type rapid boom-hoist for crane duty, with conventional worm-geared boom-hoist optional; fully enclosed traction gears running in oil; double fully-enclosed traction brakes controlled from the cab; a 56-inch machine-finished roller path turntable with roller bearing "hook" rollers; interchangeable clutches on drum, swing, retract and boom hoist; welded steel design for strength and resistance to shock load and to provide positive alignment of machinery parts; glass all around in operator's cab.

New convertible excavator.

This machine may be quickly converted from one attachment to another without mechanical alteration.

## Trade Literature

*All-Wheel Drive for Heavy Duty Service,* 8 pages. Marmon-Herrington Company, Indianapolis.

*Rex Big Mixers for Modern Mixing Plants.* 8 pages. Chain Belt Company, Milwaukee.

*Model 20 General Purpose Hoist.* 4 pages. American Hoist & Derrick Company, St. Paul.

*Electroline-Fiege Positive Grip Wire-Rope Connectors.* 16 pages. Electroline Company, Chicago.

*The Aridifier.* 4 pages. Logan Engineering Company, Chicago.

*The Safe-Line Wire Rope Clamp.* 4 pages. National Production Company, Detroit.

*Little Dave Brickmaker.* Folder. R. F. Reed Company, Three Rivers, Michigan.

*Dual Crusher Portable Plants.* Series of folders. Universal Crusher Company, Cedar Rapids, Iowa.

*Rebuilt Motor Generator Sets.* 4 pages. Chicago Electric Company, Chicago.

*Nozzles and Nozzle Accessories.* 16 pages. Spraying Systems Company, Chicago.

*Duplex Dual-Axle Drive for Chevrolet Trucks.* 4 pages. Duplex Machinery Company, Battle Creek, Michigan.

*Welding and Cutting Equipment.* 40 pages. Victor Equipment Company, Los Angeles and San Francisco.

*Improved Tension Welded Leather Belting.* 24 pages. Chicago Belting Company, Chicago.

*Cottrell Process of Electrical Precipitation.* 24 pages. Western Precipitation Corporation, Los Angeles.

*Raymond Bowl Mill for Direct Firing Rotary Kilns.* 4 pages. Raymond Pulverizer Division, Combustion Engineering Company, Chicago.

*The Koehring Wheeler.* 8 pages. Koehring Company, Milwaukee.

*Reversible Pennsylvania Hammermills.* 4 pages. Pennsylvania Crusher Company, Philadelphia.

### INCORPORATIONS

*Muncie Ready Mixed Concrete Company,* Muncie, Indiana. Incorporators: D. H. Binford, W. G. Morrison and J. F. Gubbins.

*Northville Sand & Gravel Company,* Detroit. $50,000. Esther Selzer, 14900 Linwood Avenue.

*Logan Sand Company,* Logan, West Virginia. $5,000. Incorporators: P. C. Minnotti, D. H. Jones and S. W. Ferrell.

*Owensboro Sand & Gravel Company,* Owensboro, Kentucky. $50,000. Incorporators: William M. O'Bryan, T. J. Bartlett and Joseph Nall.

*Pacific Stone Company,* Seattle, Washington. $50,000. O. M. Moen, 4257 Eighth Street, N. W.

*E. P. Pitts Sand Corporation,* Nichols, South Carolina. 200 shares n.p.v. Incorporators: Charles H. Locher, B. G. Locher, and Elizabeth Pitts.

The offices of F. L. Smidth & Company, New York City, are being moved to 60 East Forty-second Street.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**MANUFACTURING CO. - ADRIAN, MICH.**
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**Manufacturers of the famous STEARNS JOLTCRETE Machines, power and hand operated strippers, down-face block machines, brick machines, manhole block machines**

# The CONCRETE MANUFACTURER

May, 1940

A SPECIAL SECTION OF PIT AND QUARRY DEVOTED TO PRODUCTION MARKETING AND USES OF CONCRETE PRODUCTS AND READY-MIXED CONCRETE

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## Directors Meet May 16

The semi-annual meeting of the board of directors of the National Ready Mixed Concrete Association will be held at the Palmer House, Chicago, on Thursday, May 16.

In view of the importance of several questions affecting the industry which will be considered at the meeting, it is hoped that a full representation of the board will be in attendance.

## Purchase Topeka Plant

The Kirkham Concrete Products Company plant at Topeka, Kansas, has been purchased by Oscar H. Schmidt, Richard L. Schmidt and L. Rosner. The business will be continued under the name of the Capitol Concrete Products Company, Inc., in the same location, with R. L. Schmidt as manager.

The new company will continue in the production of concrete blocks and will add concrete culverts, sewer pipe, septic tanks, burial vaults, concrete joists and other products.

The new manager of the business has been associated with his father, Oscar H. Schmidt, in the Schmidt Concrete Products Company, of St. Joseph, Missouri.

## Plans $50,000 Plant

In line with a decision to concentrate on the manufacture of its line of products rather than to license other concerns to use its patents and processes, the Cemenstone Corporation of Pittsburgh is reported to be planning a $50,000 concrete-products plant on Neville Island.

## F. L. Mays Advanced

Fred L. Mays, for a number of years manager of the Columbia, South Carolina, operations of the Carolina Concrete Pipe Company, has been appointed assistant general manager of the company.

Plants are also operated at Charlotte and Lileville, North Carolina.

FIRE
Destroys Box Factory at Suamico
IT ALONE WAS LEFT STANDING
This newsphoto tells the story of concrete masonry firesafety. Get this value and a dozen-odd others at little or no extra cost. See a masonry builder or Badger Concrete Company, 191 Marion Street, Oshkosh.
Churches Ho
Scout Servic
Court Disposes
Play FIRE Safe . . Build with Blocks . . with
BADGER BLOX

**Utilizing a news picture which appeared in a Green Bay paper showing the result of a fire at an industrial plant, the Badger Concrete Company of Oshkosh, Wisconsin, advertised the safety of its "Badger Blox" as illustrated above. Superimposed on the reproduction of a newspaper story and the photograph in this unique advertisement was a picture of a concrete block captioned: "It Alone Was Left Standing." The copy continued: "This newsphoto tells the story of concrete-masonry fire safety. Get this value and a dozen-odd others at little or no extra cost."**

By HARRY F. UTLEY

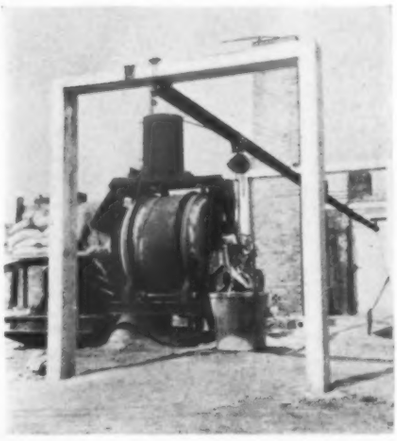
# These New Units May Furnish Answer to Low-Cost Concrete Floor Problem

Forms, cardboard-tube cores, reinforcing rods and hangers being assembled on vibrating tables preliminary to pouring. Tubes already assembled in hangers may be seen behind the workmen.

THE concrete-products industry and the building-construction field in general are due to hear a lot in the immediate future about the "Postonway" sysem of precast concrete-floor construction. The system, on which numerous patents are pending, was designed by Emmett Poston and W. A. Brewerton of the Poston-Springfield Brick Company of Springfield, Illinois. Already about 40 prominent concrete-products makers throughout the country have been licensed to manufacture and sell the units.

Postonway units are precast of reinforced concrete in lengths up to 25 feet using either natural or manufactured light-weight aggregates. They are 12 by 6 inches in cross-section with five reinforcing bars running longitudinally through each unit, and two round coreholes, each 4⅜ inches in diameter, extending the length of the unit. The cores reduce weight and save material without sacrificing strength. As the accompanying illustrations indicate, the position of the reinforcing materials in relation to the coring is such that, longitudinally within the units, an effective primary I-beam construction of about 6 by 6 inches is accomplished on 12-inch centers, with secondary I-beam shapes formed at the joints. The units, placed side by side, form a perfectly level, smooth floor surface and an even-textured ceiling on the underside.

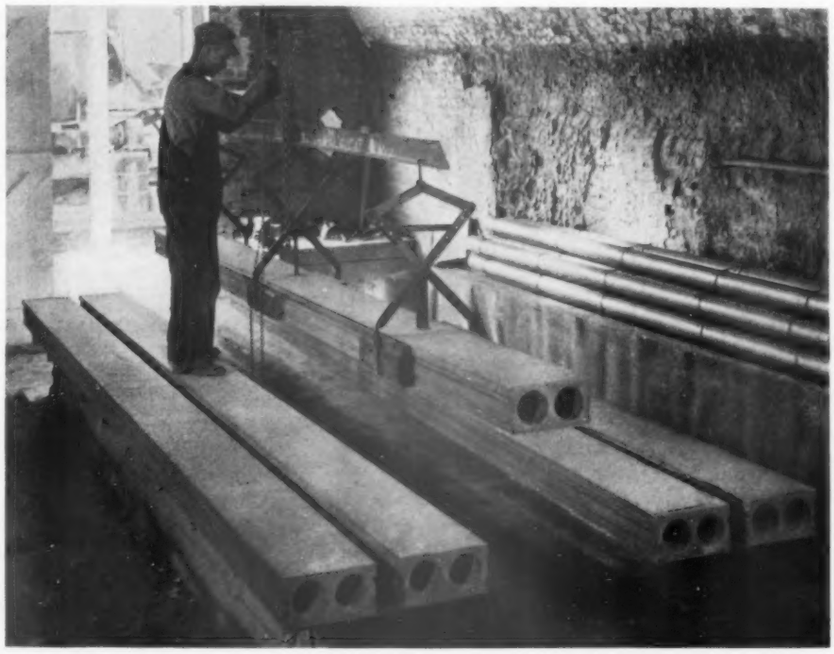
At the Poston-Springfield plant,



The mixer and concrete bucket. The box frame supporting the monorail was made from three of the Postonway units.

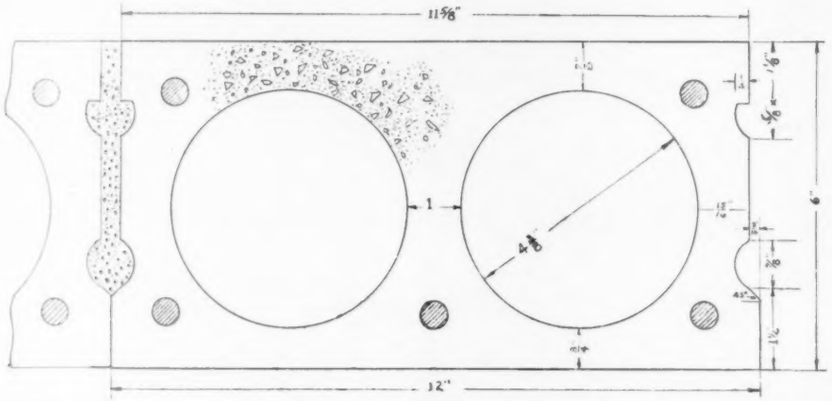
where operations have been under way for many weeks, line-production methods are employed. A monorail system extends from the mixer, through the plant, and out into the storage yard. All units manufactured at this plant are made of Waylite concrete. A Rex 27-E revolving-drum mixer discharges the material into a concrete bucket which moves into the plant over the monorail. The concrete is emptied into the floor-unit forms, and the bucket returns for another load.

The units are manufactured on special vibrating tables, the beds of which are composed of single pieces of ½-inch steel plate 6 feet wide and 25 feet long, rigid and perfectly smooth. The forms, or dividing plates, are of pressed steel and have ridges so as to produce channels along the sides of the units which serve to key the concrete members to-



After 8 hours' curing the forms are stripped and a special grapple hoist carries the units out into the yard over the monorail system.

gether when grout filler is poured in the joints after they are laid in a building. Each table is thus capable of producing five 25-foot units, or 125 lineal feet, at one pouring. After the forms are filled the electric-motor-driven vibrator beneath the table is operated for a short period—about 15 seconds—to compact the concrete. Surplus concrete is removed by passing a strike-off tool across the forms. This completes the casting process.



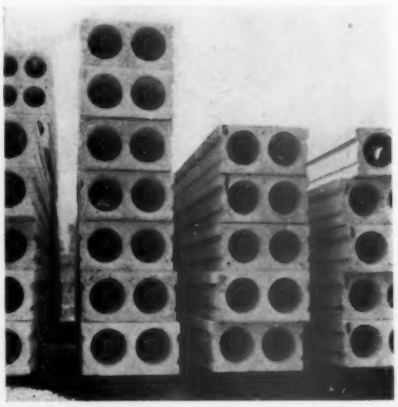

Cross-sectional sketch of one of the units showing dimensions, position of reinforcing rods and cores, and channeled sides which when filled with grout key the units together.

The manner in which the cores are formed and the reinforcing placed is interesting. The coring is accomplished inexpensively through the use of specification cardboard tubes similar to the familiar mailing tube. These are 4⅜ inches in diameter and are purchased in lengths as desired. Five reinforcing rods, ranging from ¼ to ¾ inches in diameter depending upon the maximum strength desired, are also placed in each form. The rods and both cardboard tubes are held in proper position by special wire hangers spaced 4 feet apart. One of the accompanying photographs shows this assembly being made.

Unloading and piling the units in open-air storage.

Four of these vibrating tables are handled in all operations by two men. High-early-strength cement is used, allowing the forms to be stripped 8 hours after pouring. The units are then spray-cured for three days when the desired strength, approximately 3,500 p.s.i., develops. A special grapple-hoist transfers the units, one at a time, via the monorail system to outdoor storage. Lengths shorter than standard castings are cut with a power-driven carborundum saw, a Stanley "stone saw" being used at the Springfield plant.

Architects, builders and concrete-products men who have become familiar with Postonway units are said to be enthusiastic over them because of their low cost, easy economical installation and the fact that they combine, in a structural member, finished floor and ceiling surfaces as well.



Close-up view of some of the finished units.

Floors need only be finished with paint, or other surfacing material such as wood, carpeting or linoleum. Ceilings have a pleasing texture achieved by the strike-off tool when in the forms, and may be painted or calcimined. Through the use of these units there is no loss of time in form construction, pouring of concrete, waiting for curing to take place, cold weather precautions, or other delays encountered with conventional concrete-floor construction. With Postonway units laid rapidly in place the mason proceeds immediately with the walls.

The use of these units has been approved by the Federal Housing Administration and houses employing them are eligible for F.H.A. construction loans.

License rights are granted on a royalty basis and territories are protected. The equipment is supplied through the Poston-Springfield Brick Company. The cardboard tubes are manufactured in many metropolitan centers. Mr. Poston plans to manufacture tubes in the near future, however, on a machine to be mounted on a large truck or semi-trailer which will go direct to the plants of the licensees and make up desired quantities of the tubes "on the job".

Stripper used in the concrete-block plant.

Although quite inexpensive when purchased and shipped already made up, they will cost the concrete-products maker about half as much when made on the job, Mr. Poston believes. And low cost in solving the concrete-floor problem has been his aim throughout the creation and development of the Postonway process. The unsolicited rush of concrete-products makers to acquire local rights to use the process leads him to believe he has succeeded.

The company has been producing building materials for fifty years and has been making concrete units for several years. A Besser Champion power stripper, complete with mixer and charging hoist, is employed in the block plant where George "Slim" Moon has charge of production.

By HARRY F. UTLEY

LEFT—Batching plant and two open-top truck-mixers operated by the Egyptian Concrete Company at Salem, Illinois.

# Equips Two Concrete Plants to Serve Illinois Oil-Boom Town

A LITTLE more than a year ago the town of Salem, a typical central Illinois community of some 4,000 people, was experiencing hard times and poor crops. Money was scarce, business was in the doldrums. Since then Salem has discovered that it was sitting on a fortune. Its yellow clay soil, rather poor farm land, still wasn't much good on the surface. But down below—way down—they struck oil!

To-day Salem is the little giant of the oil towns. The Salem wells are producing more oil than any other pool listed in the oil reports. Business is booming, bewilderingly so. The population has tripled. Small houses rent for $50 to $150 a month. New buildings spring up almost overnight. Activity is at fever pitch.

Because building materials are in such great demand, the Krall Construction Company of Decatur went into Salem, organized the Egyptian Concrete Company, and since March 15 of this year has been selling all the ready-mixed concrete it can batch, all the concrete blocks it can mold and cure.

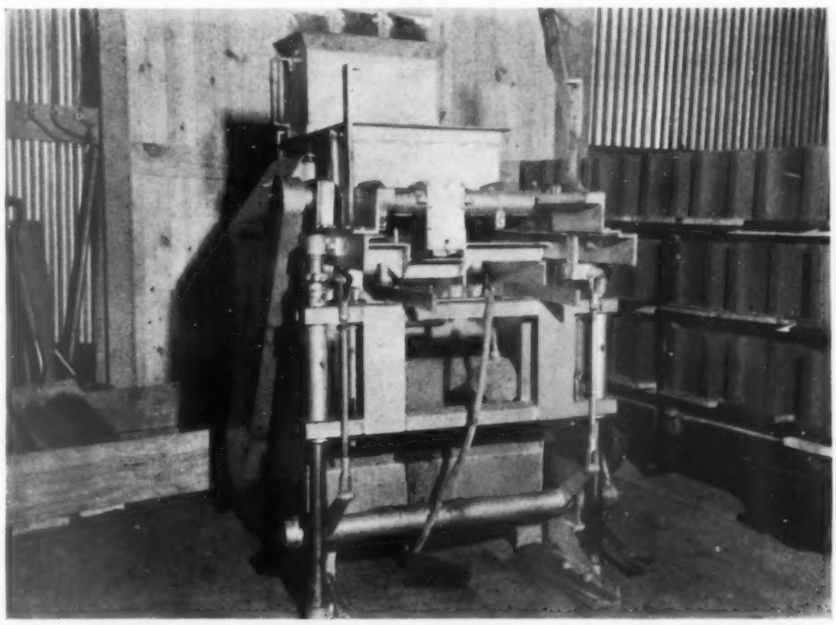
Quarters of the Egyptian Concrete Company are more or less temporary at present, just as everything about this lusty little town has a more or less temporary air about it. But oil has been found at five distinct levels—five "horizons" as the oil men express it—practically assuring Salem a generous supply of the "black gold" for many years, and permanence in structures will come, is arriving, as sales of the Egyptian concern indicate.

The plants are located at 700 Lincoln Avenue on a siding of the Baltimore & Ohio Railroad. A Butler all-steel compartment bin equipped with a weighing batcher proportions the concrete materails into two Concrete Transport open-top truck-mixers. These mixers are rated at 1-cubic yard capacity each but have been transporting closer to 1½ cubic yards, according to Superintendent G. W. Long. Aggregates are loaded into the compartment bin by a Bay City Model 25 excavator equipped with a ½-cubic yard clam-shell bucket. All the materials are received by railway.

Concrete blocks are being manufactured in a frame building adjacent to the batching operations of the ready-mixed-concrete plant. The production machine is a Kirkham vibrator, also manufactured, as are the mixers, by the

(Continued on page 72)

This ½-cubic yard clam-shell crane loads the batching bin.



The vibration machine which makes the blocks. Another one like it is soon to be installed.

# "TRIALS OF A CONCRETE ORDER CLERK"

## Wherein Are Indicated Some of the Daily Problems of a Ready-Mixed-Concrete Plant

THIS humorous skit, presented at the 1940 convention of the National Ready Mixed Concrete Association at St. Louis in January, was prepared by H. F. Thomson and A. S. Butterworth of the General Material Company of St. Louis. The various *rôles* were assumed by employees of the company.

*(Buzz-z-z-z)*

*Clerk.*—Ready-Mixed Concrete.

*Mrs. A.*—Is this the company that is sending those big trucks past my house so early in the morning?

*Clerk.*—I could not say, madam. We have some trucks on the street, but there are several other companies operating trucks in this city. Where do you live?

*Mrs. A.*—I live at the corner of Spring and Shaw and I am not going to put up with the noise. I had a bridge party last night. The gang did not go home until 4:00 o'clock this morning and now I have to sleep. So please stop hauling past my house.

*Clerk.*—Can you describe the trucks?

*Mrs. A.*—Well, they are great, big, round trucks. I don't see why they have to start so early in the morning when I want to sleep.

*Clerk.*—Are there any other trucks passing your residence?

*Mrs. A.*—Oh, yes, but I am going to call them all up and make them stop as I just must sleep. I always have to *sleep* after one of my parties because the gang drinks too much and is very noisy.

*Clerk.*—I am surely sorry that you are being disturbed. We understand that, because your gang is noisy at night, you think all trucks should be very quiet during the day time, so you can sleep. I will tell our drivers to put on their ear muffs while they are passing.

*Mrs. A.*—Thank you, very much. I must have my *sleep.*

*(Buzz-z-z-z)*

*Clerk.*—Ready-Mixed Concrete.

*Mr. B.*—This is the XYZ Company. We would like to know if you can deliver concrete all ready to be placed in a sidewalk?

*Clerk.*—Yes, at any time except Saturday afternoon.

*Mr. B.*—Well, how much would it take for a sidewalk 4 feet wide and 162 feet long, and how much would it cost?

*Clerk* (calculating).—That would require 8 cubic yards for a sidewalk 4 inches thick. The concrete would be delivered in loads of 2 cubic yards. The price for a 1-2-4 mix, which is the quality required by city regulations, is $10 per cubic yard.

*Mr. B.*—All right, send it to 3100 Compton Avenue.

*Clerk.*—Have you made arrangements for a city permit and inspection?

*Mr. B.*—No. I didn't know it would be necessary for such a small job.

*Clerk.*—You should make such arrangements; otherwise your work might be rejected by the city and you might have to remove the walk.

*Mr. B.*—I am glad you told me. I will arrange it and call you when we are ready.

*(Buzz-z-z-z)*

*Clerk.*—Ready-Mixed Concrete.

*Mrs. C.*—Do you people send out mixed cement that we could use in making an ash pit in our back yard?

*Clerk.*—Yes, we do. Can you tell me what size pit you intend to build?

*Mrs. C.*—My husband says it is 6 feet long and 4 feet wide and 5 feet high.

*Clerk.*—Do you wish a concrete floor in the pit? And how thick are the walls?

*Mrs. C.*—My husband says we want a floor and to make the walls 4 inches thick.

*Clerk* (calculating).—That will require 2 cubic yards of concrete, which should be a 1-2-4 mix and will cost you $10 per yard, a total of $20.

(Pause)

*Mrs. C.*—Haven't you any cheaper concrete? My husband says he has some friends that bought cement for this same size pit for $16.

*Clerk.*—We have several grades of concrete that we could sell you at a lower rate but would not recommend them where hot ashes are to be dumped into the pit. Perhaps the pit built by your friend has cracked from the hot ashes.

*Mrs. C.*—Oh, yes, my husband says it has cracked, but he thought that had to be with an ash-pit.

*Clerk.*—No, that is not necessary if you use the proper kind of concrete and put it in properly.

*Mrs. C.*—All right, send it on out to 3628 Delor Street. Send the bill with the concrete and we will pay for it right away.

*Clerk.*—We will send it out at once. Thank you.

*(Buzz-z-z-z)*

*Clerk.*—Ready-Mixed Concrete.

*Mr. D.*—Do you deliver concrete on Saturday?

*Clerk.*—Yes, on Saturday morning.

*Mr. D.*—Well, send me out a 2-yard load so that it gets here as late as possible. You see I am going to put it in after I get home from the office at 12:30.

*Clerk.*—What is the name and address please?

*Mr. D.*—John Jones, and I live at the northwest corner of Elm and Gore in Webster Groves.

*Clerk.*—We will have it there for you Saturday afternoon. Thank you.

*(Buzz-z-z-z)*

*Clerk.*—Ready-Mixed Concrete.

*Driver.*—This is driver on truck Number 129 at Kings Highway and Lindell. My left front tire is flat and I have a traffic lane blocked.

*(Buzz-z-z-z)*

*Clerk.*—Garage? Truck 129 at Kings Highway and Lindell with left front flat, blocking traffic. Rush.

*(Buzz-z-z-z)*

*Clerk.*—Ready-Mixed Concrete.

*Mr. E.*—This is the Blank Construction Company. Can you send us 20 yards of 1-3-5 concrete to 1218 Newstead right away?

*Clerk.*—How fast do you want it and what slump?

*Mr. E.*—Send a load every 3 minutes and make it 5-inch slump.

*Clerk.*—It will start at once.

*(Buzz-z-z-z)*

*Clerk.*—Ready-Mixed Concrete.

*Mr. F.*—This is John Smith at 405 Big Bond Road. I want to put in a fish pond and wish to know how to get the concrete, what kind, and would like to know if I can have it colored blue. Also, whether I will have to have the pond made waterproof or not?

*Clerk.*—Please give me the dimensions.

*Mr. F.*—I am figuring on making it oval, 6 feet long and 4 feet wide and 3 feet deep.

*Clerk.*—How thick do you want the walls and floor?

*Mr. F.*—I had figured that 6 inches would be all right.

*Clerk* (calculating).—That will require 4½ yards of concrete which should be a 1-2-3 mix with waterproofing. The concrete will cost you $11 per yard and will require waterproofer at $2.10 additional per yard. We can put a coloring in the concrete but believe you will get better results if you will paint the concrete with a pigmented cement paint after the concrete has cured.

*Mr. F.*—Will the concrete or waterproofing have any effect on the fish?

*Clerk.*—No, sir.

*Mr. F.*—How do you make the deliveries and how many men will I have to have to place the concrete?

*Clerk.*—Our regular truckload is 2½ cubic yards. The truck can back up to your form work and discharge directly into the form. One man can spade and vibrate the concrete while the driver is coming back for his next load.

*Mr. F.*—Can you have a load here at 2:00 o'clock?

*Clerk.*—Yes, we will have it there at that time. We will let one truck make all the loads unless you find you can use it faster, in which case you can call us, and we will put on another truck. We thank you for the order.

*(Buzz-z-z-z)*

*Clerk.*—Ready-Mixed Concrete.

*Miss G.*—Are you the people that sell this cement that comes all fixed up in those big trucks that turn over?

*Clerk.*—Yes, madam, we do.

*Miss G.*—Well, I want to put up a fence with 14 posts so they won't move and a friend of mine told me to put them in cement.

*Clerk.*—That is a very good form of construction for a permanent fence. If you will tell me how large you are going to make the post holes and the size of the posts I can figure how much concrete it will require.

*Miss G.*—The posts are iron and I guess they are about 2½ inches across. You people should know how big I should have the holes dug.

*Clerk* (calculating).—Yes, madam, the holes should be 3½ feet deep and 12 inches in diameter for that size post. This would require ½ cubic yard of concrete.

*Miss G.*—How much would that cost?

*Clerk.*—That small amount of concrete would cost $6. On a job of that character it is sometimes necessary to hold the truck longer than the allowable free time of 15 minutes. For any time you hold the truck over 15 minutes there would be an additional charge at the rate of $3 per hour.

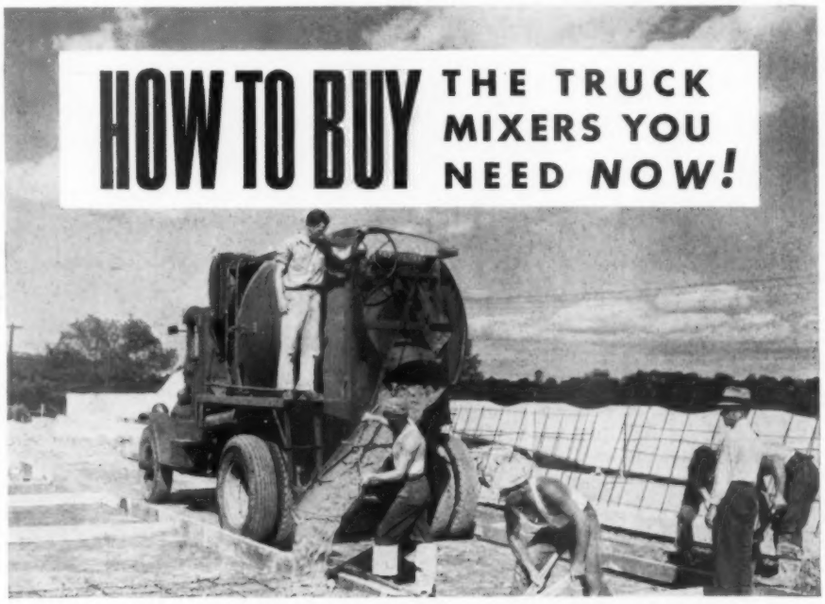
*Miss G.*—Can you send it out at 10:00 o'clock this morning?

*Clerk.*—Yes, madam. What is the name and address, please?

*Miss G.*—6312 Southwest Boulevard, and the name is T. H. Griffith. How do you want us to pay for it?

*Clerk.*—You can just give a check or the cash to the driver. Thank you for the order.

*(Buzz-z-z-z)*
*Clerk.*—Ready-Mixed Concrete.
*Mr. H.*—This is the City of Podunk, Traffic Division. I believe we have a requisition No. 308 for some concrete ready-mixed. Can you tell me how much is on this requisition?
*Clerk.*—Yes, sir. That requisition covers 27 cubic yards of your city's regular mix, to be delivered as called for and at locations you may name.
*Mr. H.*—Well, can you deliver it to-day?
*Clerk.*—Yes. Where do you wish it sent and how fast do you want it?
*Mr. H.*—It comes over here to Kalamazoo Drive. What do you mean by how fast do we want it? Just send it on over and whatever we don't use to-day we will put in the warehouse and use it when we need it.
*Clerk.*—I scarcely think that would work very well as concrete has a very bad habit of setting up hard in 5 or 6 hours and would not be very easy to handle to-morrow.
*Mr. H.*—Oh, all right. Send over one load and we will telephone you when to send more.
*Clerk.*—Thank you. We will start one load at once.
*(Buzz-z-z-z)*
*Clerk.*—Ready-Mixed Concrete.
*Mr. B.*—This is the XYZ Company again.
*Clerk.*—Yes, sir.
*Mr. B.*—I now have my permit and have arranged for city inspection, so you can send my concrete on over.
*Clerk.*—That was to 3100 Compton Avenue, was it not?
*Mr. B.*—Yes, sir.
*Clerk.*—How fast do you want it?
*Mr. B.*—I guess about 15 minutes should be between each load.
*Clerk.*—We will start it at once.
*Mr. B.*—We wish to thank you very much for calling these matters to our attention, as we might have been in a jam without your advice.
*Clerk.*—It is always a pleasure to serve. We thank you for the order.
*(Buzz-z-z-z)*
*Clerk.*—Ready-Mixed Concrete.
*Mr. E.*—This is Blank Construction Company again. Hold the balance of our order for concrete. Some one over here based that 20-yard quantity on square yards instead of cubic yards. Will call you if we want more than is on the way.
*(Buzz-z-z-z)*
*Clerk.*—Ready-Mixed Concrete.
*Mr. J.*—Is the city inspector there?
*Clerk.*—Yes, just a minute and I will connect you. There you are.
*Mr. K.*—City inspector talking.
*Mr. J.*—This is the architect's inspector on the Upland sewer job. The specifications call for a slump of 4¼ inches. The concrete you are sending has a slump of 4⅜ inches. Can you correct this?
*Mr. K.*—Yes, I will take care of it at once.
*Clerk.*—Yes.
*Mr. K.*—Give me the mixing plant.
*(Buzz-z-z-z)*
Mr. L.—Mixing plant.
*Mr. K.*—Cut ½ pint of water per load out of the concrete you are sending to the Upland sewer job. The concrete is *far* too wet.
*Mr. L.*—All right; we will reduce the water.
*(Buzz-z-z-z)*
*Clerk*—Ready-Mixed Concrete.
*Mr. M.*—Is your design engineer there?
*Clerk*—Yes, sir. Just a moment.
*Engineer*—Engineering department.
*Mr. M.*—This is the Hot Operating Company. We have a problem in placing some concrete and would like to have your suggestions as to a method of handling. We wish to pour concrete for a vat 30 feet in diameter and 20 feet high, with walls 7 inches thick and very heavily reinforced. We are figuring on vibrating, but our real problem is to get the concrete in place at a low temperature to delay setting until a complete circle is made around the forms. During this warm weather the temperature of the room where we are constructing the vat is about 110 degrees F. The job is about 4 miles from your mixing plant. How would you suggest serving this job with ready-mixed concrete?
*Engineer*—I have in mind a method by which the temperature of concrete as delivered at your job could be reduced materially and thereby allow you roughly 30 minutes additional time for placing.
*Mr. M.*—That sounds very interesting and is exactly what I need. How could this be accomplished?
*Engineer*—We could arrange to use crushed ice in place of mixing water. This ice would be weighed for each batch, so that the melted amount would be the same as ordinary mixing water, and thereby maintain any given water-cement ratio. The concrete should reach you at a temperature of 55 to 60 degrees, and will probably not be over 70 degrees when placed in the forms. This would mean a reduction of about 15 degrees, which would delay the time of initial set considerably.
*Mr. M.*—If I can get concrete in that manner it will solve my problem. What would be the additional cost?
*Engineer*—That would depend upon the rate at which you place the concrete. We would have to arrange for the delivery of the crushed ice in comparatively small lots to prevent undue melting loss. Roughly I would estimate that, on your operation, the additional cost would be approximately $1.25 per cubic yard.
*Mr. M.*—Would that method have any effect upon the ultimate strength of the concrete?


AND PAY FOR THEM AS YOU USE THEM!

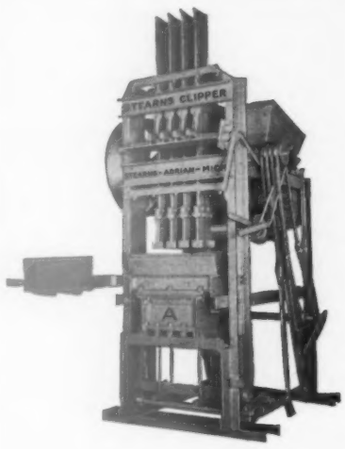
● Want to add to your fleet of truck mixers? Want to replace old-fashioned units with new, mechanically superior Rex Moto-Mixers? Want to go after the ready-mixed concrete business in your territory without too great an initial investment?

If you do, investigate Rex Moto-Mixers, now available on the time payment plan that allows 12 full months for you to pay!

You'll find that Moto-Mixers, with their unique advantages including Rex high discharge (jackass hoist) and Rex one-point water distribution, are easy to buy, economical to own and profitable to operate! Hundreds in the field during the past 12 years, serving dozens of satisfied customers, indicate how well you'll be pleased with Moto-Mixer performance.

Don't delay! Go today to your nearest Rex dealer or write to our home office for complete details on financing the sale of the number and size of Rex Moto-Mixers in which you are interested. Also ask for informative literature. Address the Chain Belt Company, Dept. MM-5, 1646 W. Bruce Street, Milwaukee, Wis.

ASK ABOUT THE TIME PAYMENT PLAN!
BUY
REX
MOTO-MIXERS
AND BE RIGHT!




The Clipper Stripper, shown above, available in 5 models, is only one of the popular machines in the ANCHOR Line of Complete Equipment for the Concrete Products Plant. ANCHOR Engineering Service in the design of new plants or revamping older operations is nationally famous. Consult us before you buy equipment or modernize your plant . . . it costs no more.

Hobbs block machines, Anchor tampers, Anchor, Jr. strippers, Stearns power strippers and Joltcrete, Stearns mixers and pallets, Straublox oscillating attachments, etc. Repair parts for: Anchor, Ideal, Universal, Stearns, Blystone mixers and many others.

ANCHOR CONCRETE MACHINERY CO.
G. M. Friel, Manager Columbus, Ohio

VIBRATION
—combined with
Pressing Makes the Best Blocks

Here's the Machine That Does It

KENT MACHINE CO.
Cuyahoga Falls, Ohio

*Engineer*—I can see no reason for any effect except the change in initial temperature.

*Mr. M.*—Can you arrange to take care of my pour with this method to-morrow morning?

*Engineer*—Yes, we can have your first load on the job at 8:30 to-morrow morning. We will check the temperature here and at the job, and also make cylinder tests to see what are the actual results. I thank you.*

*(Buzz-z-z-z)*

*Clerk*—Ready-Mixed Concrete.

*Mrs. C.*—This is the place where you are sending the cement for the ash pit. We have nearly a half wheelbarrow of cement left over. Can we get a refund on this?

*Clerk*—I am very sorry, madam, but we would have no other use for the concrete. We sent you the quantity required for the dimensions you gave us, based on using full sacks of cement as required by city regulations.

*Mrs. C.*—Well my husband says that if I could get a refund I could have the money to apply on a new hat. Good-bye.

* [Note—The temperatures observed in connection with this delivery were: at the plant 42 degrees F. (outside temperature 82 degrees F.); at the job from trucks 55 degrees F.; and in the forms 65 degrees F. The compressive strengths of test cylinders were normal.]

## Egyptian *(from page 69)*

Concrete Transport Mixer Company of St. Louis. This is one of the newer small block machines which compact the concrete by vibration. The units, all of gravel concrete, are loaded on steel racks which move on flanged wheels over narrow-gage tracks out into the curing yard. Later on regulation curing rooms are to be constructed so that the curing process can be better controlled.

In the near future the company hopes to install equipment to manufacture concrete pipes in all sizes. Mr. Long, previously mentioned as superintendent of the ready-mixed operations, is also in charge of the block plant. Although he is on the job early and late every day and would welcome residence in Salem, he is forced to drive 35 miles morning and night to Vandalia where he is living. He found it impossible to locate satisfactory living quarters any closer. Later on he may find time to build himself a residence using his own concrete blocks . . . if some drilling rig doesn't beat him to the site!

## Operations Started at New Plant in Indiana

Operations have started at the new plant and quarry of the Montpelier Stone Company located near Montpelier, Indiana. The concern is owned and managed by Murhl Smith, formerly associated with his father in the Rockledge Products Company of Portland, Indiana.

Machinery was installed during the winter months. Commercial crushed stone and agricultural-size stone will be produced.

## NEWS

A new tentative standard for truck mixers and agitators has been approved by members of the Ready Mixed Concrete Association.

The new standard supersedes the two formerly in existence, one covering the revolving-drum type, the other the open-top revolving-blade type.

The Fort Harrison Concrete Products Company of Terre Haute has taken over the concrete-block plant formerly operated in Terre Haute by the Grohne Concrete Products Company of Decatur, Illinois.

Stearns Joltcrete machines recently went into service at the concrete-products plants operated by Casper H. Haas at Kalamazoo, Michigan, and Kost Brothers, sand-and-gravel producers at Downer, Minnesota.

The Shearman Concrete Pipe Company of Little Rock, Arkansas, and the Cass City Sand & Gravel Company of Cass City, Michigan, have installed Jackson & Church Model A presses to manufacture concrete bricks.

COMMERCIAL

CORED Steel PALLETS

Cored pallets mean better curing and quicker curing, which cuts costs, and, because more blocks can be put on the rack or car, kiln capacity is increased.

They are cheaper to clean and oil. With cast iron cored pallets, rust is not a factor.

There is no alleged monopoly in the manufacture of cored pallet machines. Competition on this type of machine provides price protection for buyers.

THE COMMERCIAL SHEARING AND STAMPING CO.
YOUNGSTOWN, OHIO

## SAUERMAN LONG RANGE MACHINES

**For Digging, Conveying, Stockpiling**

Sauerman Scraper handles 100,000-ton storage pile of crushed rock for cement mill.

One man with small Sauerman Cableway digs 500 tons of river gravel per day.

IN deciding what type of equipment to adopt for any problem of excavating or stockpiling, consider the following good reasons for choosing a Sauerman machine:

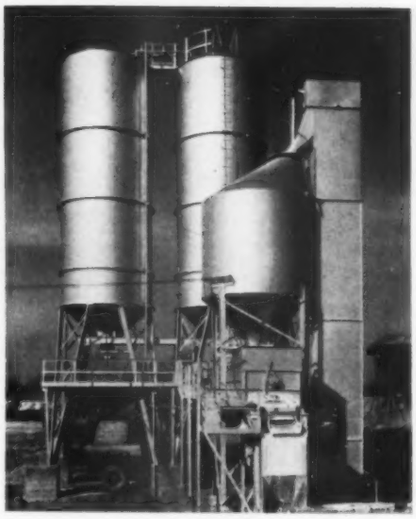
(1) Sauerman machines dig, convey, and dump in a continuous automatic operation.
(2) First cost is reasonable.
(3) Operated by one man.
(4) Maintenance is simple.

As a result of the above features, Sauerman machines are able to handle wet or dry excavation and the storing and reclaiming of bulk materials at the lowest possible cost per cubic yard. Hundreds of leading pit and quarry operators will testify to the truth of this statement. We'll be glad to study your problem and tell you what a Sauerman machine can do for you.

*WRITE FOR CATALOG*

**SAUERMAN BROS., INC.**
**434 S. Clinton St., CHICAGO**

## THE BROOKS-TAYLOR *Lime Putty Plant*



**ANOTHER aged lime putty plant has just been placed in service. It is a standard two-tank unit for the Massaponax Sand & Gravel Corp. at Richmond, Va. This well-known supplier is now equipped to supply sanded lime putty for brick mortar to its customers. Write for information on obtaining the exclusive rights to produce aged lime putty in your territory under the Brooks-Taylor method.**

**CHICAGO BRIDGE & IRON COMPANY**

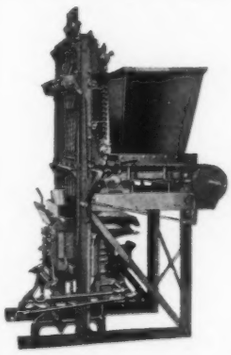
| | | | |
|---|---|---|---|
| Chicago | 2451 Old Colony Bldg. | Tulsa | 1648 Hunt Bldg. |
| New York | 3389—165 Broadway Bldg. | Birmingham | 1503 North Fiftieth St. |
| Cleveland | 2264 Rockefeller Bldg. | Dallas | 1486 Liberty Bank Bldg. |
| Philadelphia | 1645—1700 Walnut St. | Detroit | 1552 Lafayette Bldg. |
| Boston | 1550 Consolidated Gas Bldg. | San Francisco | 1092 Rialto Bldg. |
| Houston | 2919 Main Street | Los Angeles | 1457 Wm. Fox Bldg. |

In Canada: HORTON STEEL WORKS, LIMITED, FORT ERIE, ONT.

*Miles* CONCRETE EQUIPMENT

# INVESTIGATE BEFORE YOU BUY

the PIONEER EQUIPMENT of the industry, not an experiment, but a proven success with which you are assured a larger production of high quality blocks at both a lower first cost and a lower operating cost, facts well worthy of your serious consideration.



*WRITE FOR CATALOG*

**THE MILES MANUFACTURING CO.**
Dept. 20
JACKSON, MICHIGAN

# QUINN PIPE FORMS

**HAND or WET PROCESS**

Make concrete pipe on the job with *Quinn Pipe Forms.* Quinn Pipe Forms can be handled by less experienced labor and produce uniform concrete pipe of highest quality. The recognized standard of all concrete pipe.

**HEAVY DUTY CONCRETE PIPE FORMS**

Built to give more years of service—sizes for any diameter pipe from 12 to 84 inches—tongue and groove or bell end pipe — any length. Backed by years of service in the hands of contractors, municipal departments and pipe manufacturers.

**NEW MEDIUM DUTY CONCRETE PIPE FORMS**

Meet the demand for low cost equipment that produces a uniform quality of pipe in smaller amounts. Complete in every way. Stands up on any job. Same sizes as "Heavy Duty," from 12 to 84 inches—any length.

**Write Today**

Get complete information on prices and Special Construction features of Quinn Pipe Forms. Give us size of job for estimate on your pipe form needs.
Also manufacturers of concrete pipe machines for making pipe by machine process.

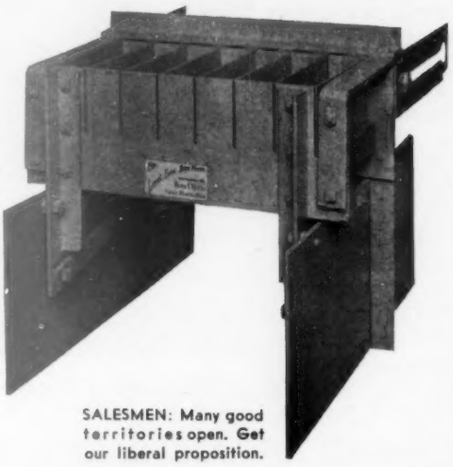
**QUINN WIRE & IRON WORKS**
1627 TWELFTH ST., BOONE, IOWA

The CONCRETE MANUFACTURER

# $15 to $20 Profit Daily

Cash in on the growing demand for concrete brick. With a small investment in a LITTLE DAVE BRICKMAKER you can supply this demand by turning out up to 4,000 brick in eight hours. Units produced on a LITTLE DAVE are uniformly strong, even in color and texture, have smooth, sharp edges and corners.

Hand-operated, sturdy and dependable, the LITTLE DAVE makes seven brick at one time, using economical plain pallets of wood or metal. An ideal supplementary machine for operators of power production equipment. Write for complete information TODAY!

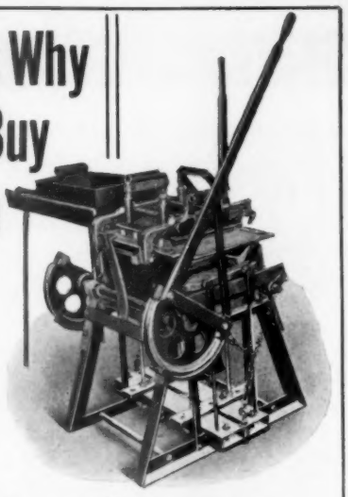


SALESMEN: Many good territories open. Get our liberal proposition.

## R. F. REED COMPANY

412 E. Michigan Ave. Three Rivers, Mich.

# 10 Reasons Why You Should Buy This Machine



1. Low initial cost
2. Lightweight; portable
3. Hand operated, fast
4. All parts adjustable
5. Produces sharp smooth, accurate units
6. Units have extremely high crushing strength
7. Machines simply constructed for long life
8. Blocks compressed both from top and bottom
9. No vibration used; maintenance cost negligible
10. Makes all types and sizes of masonry units

**Don't tie up your money in a high-priced machine which accomplishes no more. Write for particulars immediately!**

## MORTARLESS TILE MACHINE CO., Inc.

**3328 SAN FERNANDO ROAD** | **LOS ANGELES**

# PROOF AGAIN

## that BARRETT Lift Trucks Save!

The successful West Coast concrete products plant shown has eliminated breakage and speeded up handling of blocks from molding machines to curing room. Barrett Rubber-Tired Spring Frame Trucks handle up to 48 "green" blocks on pallets at a time without jarring and with minimum effort.

Today 1,500 active plants are saving with Barrett Lift Trucks. Why not try one at our expense in your plant —write for *free trial offer*, bulletin and prices.

## BARRETT

BARRETT-CRAVENS CO.

3251 West 30th Street • Chicago, Illinois

Representatives Everywhere

Barrett Handling Equipment

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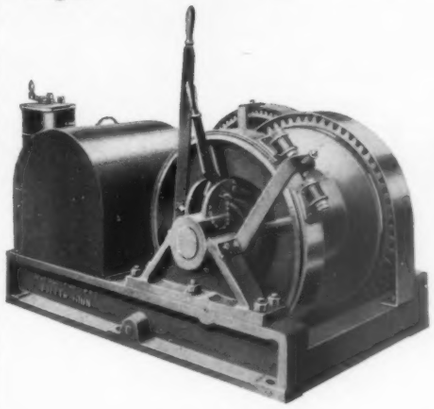
# CLYDE CAR PULLERS

Save time and money around your plant by installing husky, dependable Clyde Electric Car Pullers.

Cars can be spotted quicker and cheaper . . . no costly maintenance of a switch or yard engine . . . no delays.

Clyde drum type carpullers are made in 13 sizes with a range of capacities to pull loaded cars up to 1,400,000 pounds. Two styles of vertical capstans are also available with pulling capacities to move cars up to 1,250,000 lb. weight.



CLYDE

You'll Take PRIDE In Your CLYDE

Consult our engineering department for further details and recommendations.

**CLYDE IRON WORKS, Inc.**
**Duluth, Minn.**

# VIBRATING FEEDERS with GRIZZLY DISCHARGE

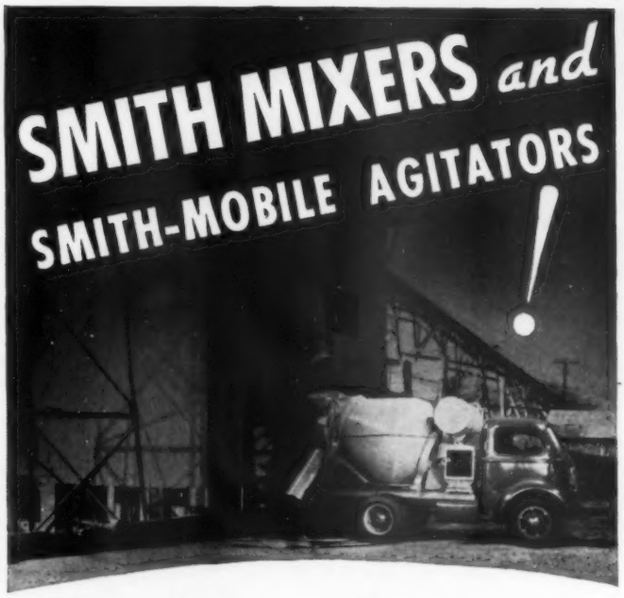
A grizzly built into the discharg[e] vibrating feeder will effectivel[y] by-pass fines ahead of crushing discharging to belt. The type [...] 48 in. long is shown.

Grizzly sections are applicable [...] or to special feeders of any w[idth]. advantages of J-T feeders whi[ch] as well as in existing plants wh[ere] altered.

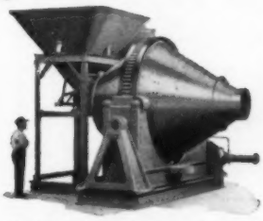
Catalog No. 650-M covers ou[r] complete line of electric vibrat[ing] ing feeders, screens, conveyors coolers, dryers and barrel pack[ers] ers. Send for your copy.

**THE JEFFREY MAN[UFACTURING COMPANY]**
**917-99 North Fourth [Street] Columbus, Ohio**

# SMITH MIXERS and SMITH-MOBILE AGITATORS!



## The Perfect Combination for PRE-MIX PLANTS



Smith 56-S Tilter with Hydraulic Tilt Unit and Batch-hopper. Pneumatic Tilt Unit Optional.

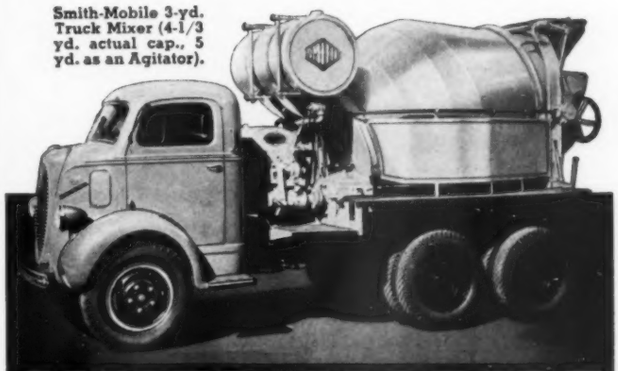
You're in the Ready-Mixed Concrete business to MAKE MONEY, and you CAN make money if you have the right equipment. Smith Tilting Mixers and Smith-Mobile Agitators have PROVEN their ability to mix and deliver uniform concrete at the lowest possible cost per yard. They're a winning combination — built and guaranteed by The T. L. Smith Company, concrete mixer manufacturers since 1900.

**SMITH TILTING MIXERS** for pre-mixing or pre-shrinking concrete. Famous all over the world for their *fast charging, thorough mixing* and *fast "tilt and pour" discharge*. Ideal for central pre-mix plants because of *low maintenance costs* and *rugged dependability*, even when worked night and day. Built in one, two, three and four yard sizes. Write for Catalog 160-A.

**SMITH-MOBILE AGITATORS** — ideal for delivering pre-mixed or pre-shrunk concrete. *Fast loading, smooth agitating, effective mixing, high discharge, fast complete discharge, slow controlled discharge, large radius of spout distribution*, etc. Smith-Mobile Agitators have all the superior advantages of the Smith-Mobile truckmixer. Four sizes. Write for Catalog 198.

**THE T. L. SMITH COMPANY**
2887 N. 32nd STREET • MILWAUKEE, WISCONSIN

Smith-Mobile 3-yd. Truck Mixer (4-1/3 yd. actual cap., 5 yd. as an Agitator).



**SMITH-MOBILE**
THE *Modern* TRUCK MIXER and AGITATOR

# "YOU TOO CAN RING THE BELL FOR PROFITS"

## WITH THE JACKSON CONCRETE BRICK MACHINE

**NO PALLETS:** The concrete is compressed so firmly that the bricks are removed by hand and piled on top of each other on flat-deck, lift-truck platforms or cars each holding 1,000 brick (this simplifies production tallies).

**CHEAPER PLATFORMS:** Since no pallets are used, the expensive tier type platform is done away with and only a flat deck platform is required. By setting a rack on top of these platforms, they can be used for concrete blocks. This does away with two sets of platforms where both brick and block are being manufactured.

**LOW FIRST COST:** Because cheaper platforms are used and no pallets are needed, the first cost is considerably lower with a Jackson brick machine installation.

**LOWER OPERATING COSTS:** Because no pallets are used a great deal is saved in handling and maintaining thousands of pallets as well as providing storage space for them when not in use.

**HIGH PRODUCTION:** Up to 14,000 brick in an eight hour day can be made on the Model "C" brick machine which has six pocket molds in the rotary table. The Model "A" brick machine, which has twelve pocket molds, produces up to 28,000 bricks a day. This is by far the fastest producing concrete brick machine on the market today.

**CLEAN, SHARP-EDGED BRICK:** Because the brick are picked off the top of the plungers as they are forced up through the table pocket, they retain all of their clean cut sharp edges, thus making good looking and more salable brick.

*WRITE TODAY FOR ILLUSTRATED FOLDER*

**JACKSON & CHURCH CO.**
**SAGINAW, MICH.**



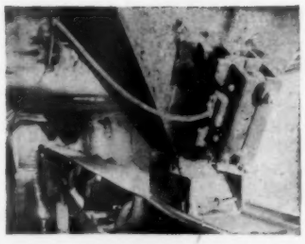
# MOVE MATERIAL *the Easy Way--*
## *"BY CONTROLLED VIBRATION"*

Electro-Magnet
**VIBRATORS**

Make the most stubborn bins and chutes flow freely

8 models—ranging from 4 lbs. to 500 lbs. in weight

Each with separate power control panel



Three crushed stone hoppers fitted with 75 lb. vibrators.

Three 20 ton Feeders controlling mix to cement plant ball mill.

Electro-Magnet
**VIBRATORY FEEDERS**

Provide rheostat control of volume flow of bulk materials, to grinders, mixers, dryers, screens, etc.

From pounds to tons per hour

Also—Scale Controlled
**VIBRATORY WEIGH FEEDERS**

*Write for latest catalogue information*

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**385 N. Lexington Ave.** **Homer City, Pa.**



## *JOIN THE PROFIT PARADE WITH*
# TRANSPORT MIXERS
## PROVEN PERFORMANCE

OPEN TOP—EASY TO LOAD, VISIBLE BLADE MIXING, WHILE LOADING, EASY TO CLEAN.
RUGGED CONSTRUCTION—FAST DISCHARGE, SIDE AND REAR.
LOWEST FIRST COST—LOWEST OPERATING COST.
HIGHEST QUALITY CONCRETE, MORTAR AND PLASTER.
TRUCK OR PLANT MIXERS.

***WRITE FOR COMPLETE DETAILS AND TEST REPORTS***
**CONCRETE TRANSPORT MIXER COMPANY**
**660 ROSEDALE AVE., ST. LOUIS, MO.**

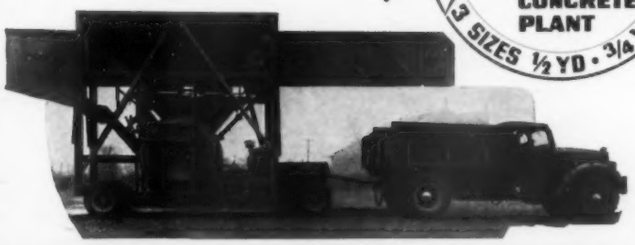
# AN *Extra* ARM FOR THE CENTRAL CONCRETE PLANT

Complete your set-up with either a ½ yd., ¾ yd. or 1 yd. Strayer Portable Concrete Plant. Make concrete *on the job* when it means extra money to you. Sure, you operate a fleet of Truck Mixers—all you need is one Strayer Plant, and you'll be prepared to handle each job the most profitable way for you. This plant was primarily designed as an extra arm for you that is why we want you to investigate it by getting the complete story today.

Cut-Away View to Show Flow of Materials

COSTS LESS THAN A TRUCK MIXER
the Strayer
PORTABLE CONCRETE PLANT
3 SIZES ½ YD. • ¾ YD. • 1 YD.

← FROM THIS TO THIS IN 30 MINUTES ↓



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*America's finest* TRUCK MIXERS & AGITATORS

by Ransome

*Higher Quality Concrete*
at no additional expense.

*There's a reason—*
Send for the facts *today!*

RANSOME CONCRETE MACHINERY COMPANY
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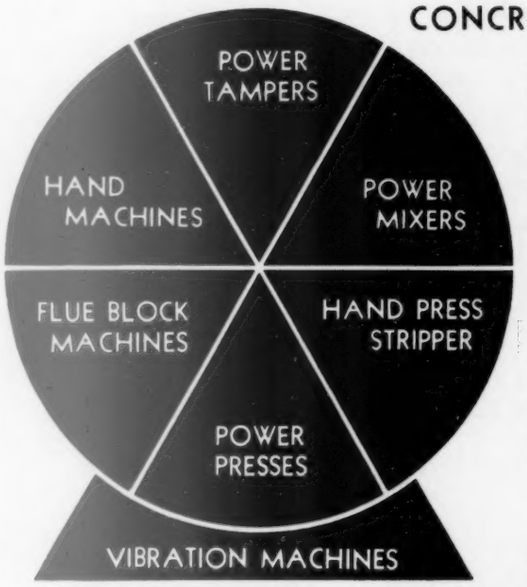
# For a "Better MULTIPLEX Cut" in 1940

## CONCRETE EQUIPMENT

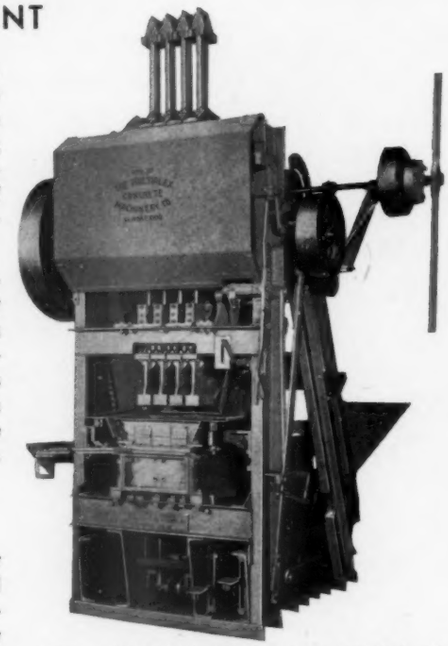



"Help yourself" to a larger slice of profits in the concrete blocks business by specifying MULTIPLEX equipment, the choice of experienced and successful operators.

MULTIPLEX has supplied the industry with high-production concrete machines—real money-makers for low-cost operation—since 1906—and the latest designs for 1940.

In addition to the above units, the MULTIPLEX line includes: Power Strippers, Super-Tampers, Tile Machines, Random-Ashlar Machines, Brick Machines, Cars, Racks, Moulds, Forms. MULTIPLEX will install complete concrete product plants designed and equipped throughout to suit individual requirements.

MULTIPLEX Super Tamper, the sensational new concrete block machine which insures better units at lower cost. Heavy duty type—gives you top *quality* production.



Famous MULTIPLEX Super Tamper, furnished with 8-bar tampers. Adaptable for all kinds of aggregate. Position-timed feeding and stripping and 5 point clutches insure quick action. Molds Ashlar units in all sizes.

*Write for full details*

The *Multiplex* CONCRETE MACHINERY CO. ELMORE, OHIO

*"We're in this business to make money —and can do it with* BLAW-KNOX TRUKMIXERS *because they mix concrete faster and we get more trips per day"*

It's a comfortable feeling to have truck mixers working for you that perform 100% under all conditions. No breakdowns—no worries.

You make a *profitable investment* when you buy Blaw-Knox Trukmixers and agitators. 24

BLAW-KNOX BLAW-KNOX DIVISION OF BLAW-KNOX CO. Farmers Bank Bldg. Pittsburgh, Pa.

Agitators and TRUKMIXERS

## START A NEW BUSINESS

*This shows one of our Multiple Molds for casting 8x8x16" concrete blocks. We manufacture a complete line of Multiple Molds for blocks (both Rockface and plain), for brick, veneer blocks, etc. We are also owner and originator of the ZAGELMEYER SYSTEM of granite veneer for blocks.*

*Make* ZAGELMEYER *Waterproof Concrete Blocks*

*A Start May Be Made With as Little as $500.00*

The Zagelmeyer System produces a block that no other system can equal. Many good territories open. Write today for further information.

**Zagelmeyer Cast Stone Block Machinery Co.**
502 S. Henry St. BAY CITY, MICH.

*Make your visit in Toledo most enjoyable*

Cheerful Rooms and Apartments furnished in the Modern manner

**Excellent Foods**
**Choice Liquors**
**Exciting Music**
**Courteous Service**

Complete in every detail. Moderate rates. 600 rooms

**Hillcrest Hotel**
TOLEDO, OHIO

# AGAIN IN 1940, more concrete is being sold by Jaeger Truck Mixers than by any other method . . . .

Jaeger Dual-Mix Truck Mixers put you in position to sell higher strength concrete, produced by the most efficient, low cost mechanism yet developed, to meet any specification or demand. The features which have made Jaeger first choice of the ready-mixed industry are still exclusive with Jaeger:

DRIVE FROM THE TRUCK ENGINE THRU SHOCK-PROOF TRANSMISSION, VACUUM-CONTROLLED FROM CAB (or separate engine drive if desired).

DUAL-MIX DRUM produces higher strength concrete—as proved by the Hollister Tests.

THROW-BACK REVERSING BLADES—proved essential to a fast, thorough mix.

DUAL REVOLVING WATER SPRAYS spray to both ends of drum; insure faster, more uniform water distribution.

SYPHO-METER TANK insures accurate water control.

RUST AND ABRASION-RESISTING ALLOY STEEL—lighter, stronger, longer lived.

**THE JAEGER MACHINE COMPANY, 602 Dublin Ave., Columbus, Ohio**

# JAEGER

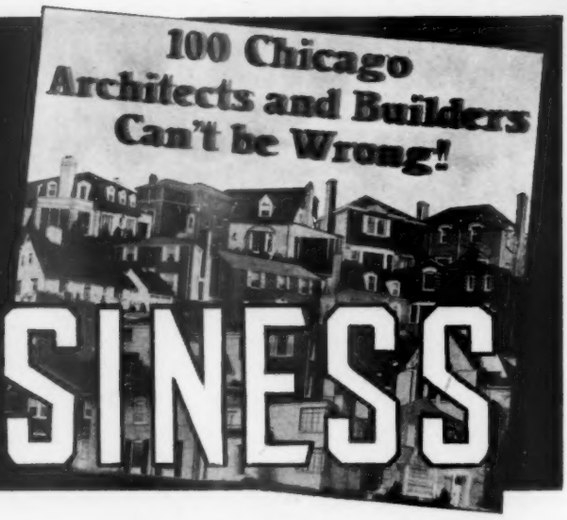
**Get the Facts Before You Buy:**

Important improvements have been taking place in Truck Mixer design. Write today for latest information on 1940 models and methods.

*Ask about Jaeger easy payment plan!*

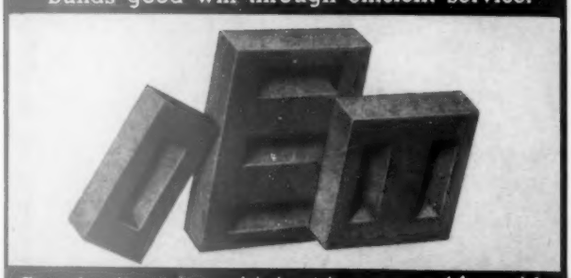
The CONCRETE MANUFACTURER

# Carlsen's FORESIGHT BUILT a BUSINESS



Automatic line production, assuring highest quality of products at lowest labor cost.

Direct from factory to job delivery, lowers cost, builds good will through efficient service.



Standard and multiple sizes, provide wide choice of structural and architectural design.

Full range of color enables each local DUNBRIK Manufacturer to serve the complete market.

Two years ago Mr. C. L. Carlsen of Chicago started manufacturing DUNBRIK and DUNSTONE. He has already achieved manufacturing success. Today he numbers among his regular customers most of Chicago's prominent residential builders. His success fully justifies his foresight and his belief that the greatest need in modern building is a better masonry material at a fair price.

In DUNBRIK Carlsen found the answer. Greater strength — lighter weight — absolute accuracy — keyed mortar bond — water repellent faces and the most complete range of colors, shades and textures. Factory to job delivery and a low manufacturing cost through automatic line production and the ability to utilize local low-cost raw materials.

With his products and cost advantages Carlsen has become the dominating supplier of quality masonry materials in his locality. The growth of his business is based on the soundest fundamental — quality at a fair price.

You, too, can build a substantial manufacturing business of your own, offering big future possibilities. Make the first step today. Write at once. Let us show you through our free book "4 Keys to Success" how you can start an exclusive franchise protected business on a modest capital.

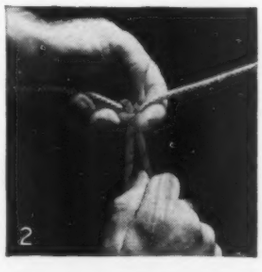
**W. E. Dunn Manufacturing Co.**
420 West 24th Street
HOLLAND MICHIGAN

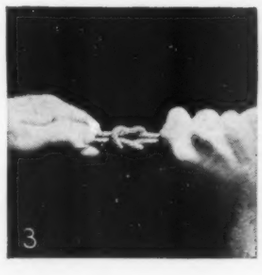
# Bigger AND fewer SHOTS

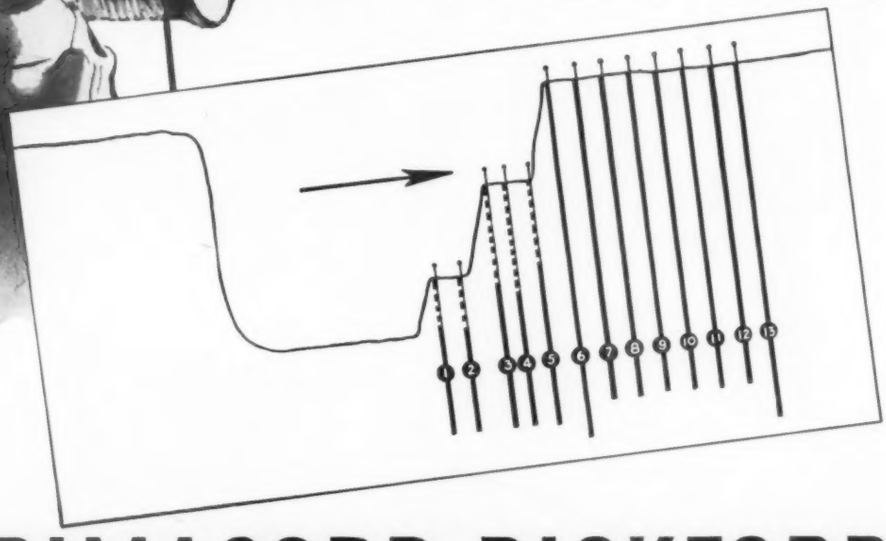
GIANT blasts are saving money for quarry and open pit operators—in time, in labor, in the moving of equipment. 10 holes—even 4000 holes!—are all in the day's work for PRIMACORD-BICKFORD Detonating Fuse. There's no limit to the depth of the holes or the intricacy of the hookup.

The powerful detonating wave travels Primacord at more than 3 miles per second. It reaches every cartridge in the column, exploding it directly. Primacord detonates the entire blast practically instantaneously, but the split-second time delay between holes and rows, provides the necessary relief of burden.

The giant blast with Primacord permits you to keep equipment on the job until all drilling and loading is finished. *That* alone saves considerable time and money.






# PRIMACORD·BICKFORD

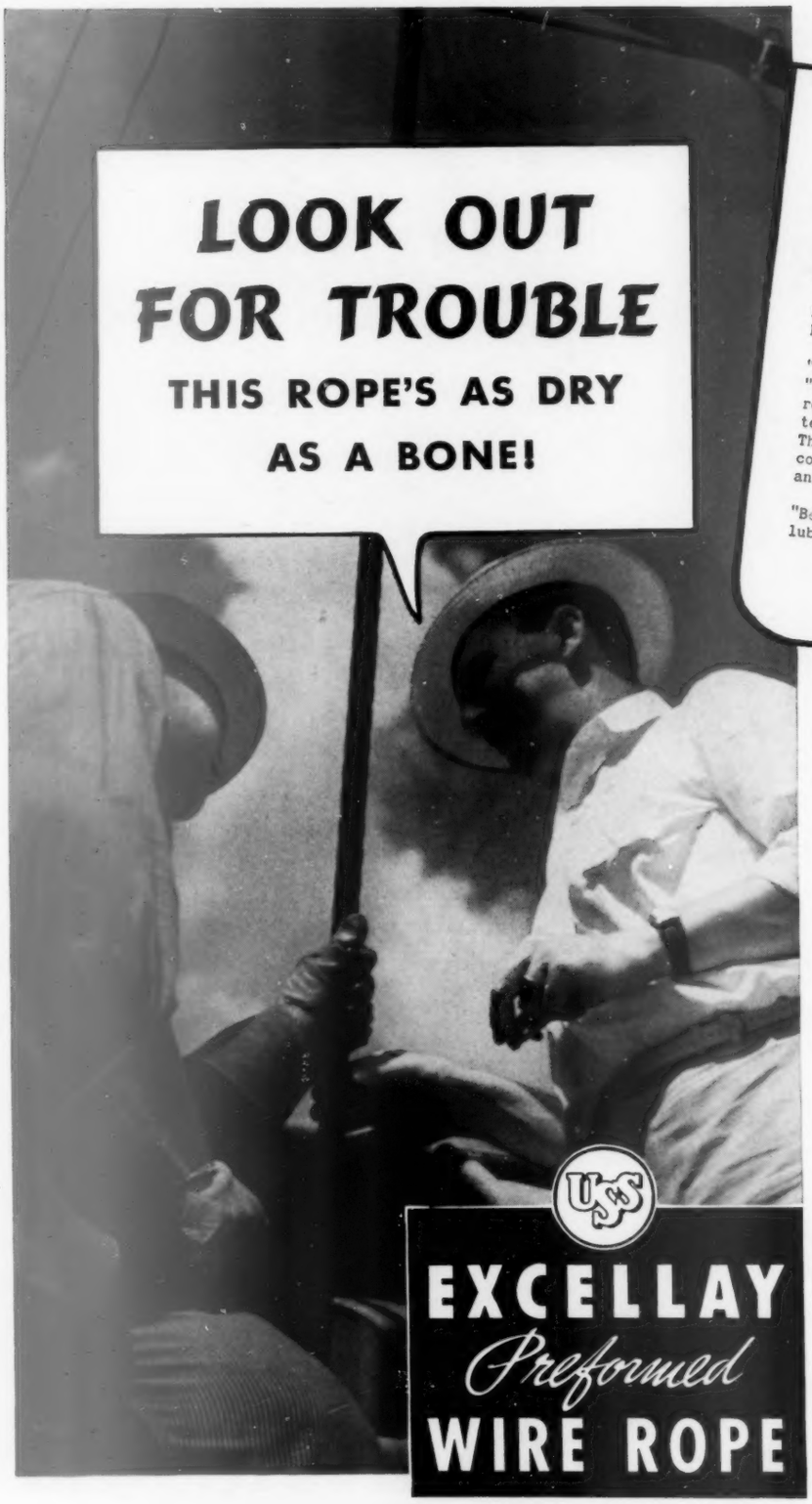
## *Detonating* FUSE

**THE ENSIGN-BICKFORD CO., Simsbury, Conn.**

*Makers of Cordeau-Bickford Detonating Fuse — and Safety Fuse since 1836*

PB20

**1.** Tie through cartridge.
**2.** Half hitch branch to main line.
**3.** Connect main line lengths with square knot.
**4.** Fuse and cap on end of main line.




FROM THE DAILY REPORT OF A
TIGER BRAND WIRE ROPE ENGINEER

Was out on a job with Mr. Long this A.M. when I came across a wire rope that was badly in need of lubrication. "Look out for trouble here," I told him, "this rope's as dry as a bone."

He looked it over. "Looks okay to me," he said, "not much wear."

"That's just the point," I told him. "You can't see what goes on inside a rope When it's not lubricated, the external appearance may deceive you. The inside wires may be badly worn and corroded and even broken from abrasion and binding."

"Better give that rope a good dose of lubricant if you want to save it."

Yours,
al

BY keeping your wire ropes properly lubricated, you save money two ways: You protect the rope from premature failure; and you reduce friction.

Proper lubrication is an effective deterrent to corrosion. It protects both inside and outside wires against destructive rusting. It keeps all wires free to slide over each other, as they must do when the rope bends over sheaves and drums. It minimizes friction and wear between individual wires, and between the rope and sheaves or guides through which it passes. It is the safest, surest method of preventing excessive wear inside the rope, where you can't see it.

See that all wire ropes are properly lubricated at regular intervals. Insure greater safety—prolong rope life—reduce lost time—get the benefits of fewer replacements. For specific recommendations on wire rope lubricants and lubrication practice, see the Tiger Brand Wire Rope Engineer who contacts you.

**AMERICAN STEEL & WIRE COMPANY**
*Cleveland, Chicago and New York*
**COLUMBIA STEEL COMPANY**
*San Francisco*
United States Steel Export Company, New York

**UNITED STATES STEEL**

# Thrifty operators insist on

# QUAKER CONVEYOR BELT

## . . . conveying costs must be kept low today!

More and more Quaker conveyor belts are being installed . . . sand and gravel operators know from actual experiences what a Quaker belt will do . . . installation records show instances where Quaker conveyor belts have already handled over a million tons of crushed rock and are still in active operation.

The reason back of these operation records is that Quaker, ever alert and progressive, are constantly keeping abreast of changing conditions and are manufacturing Quality Belts that actually deliver the plus tonnage.

It doesn't just happen that Quaker belts give such enviable tonnage records. Service is built right in from the start. Selection of specially woven duck . . . ordinary duck is not sufficient for Quaker. Long-tooth friction holds plies in a vise-like grip. The cover is of "live" rubber that does withstand the hard abrasive wear. Finally, the belt is scientifically "cured" by the latest known advancement in rubber manufacture. The finished product . . . a QUAKER belt that merits your respect. Consult us before placing your next belt order.

**QUAKER BELTS**
**for all types of conveying**

*Estimates and samples gladly furnished. Our experts may be able to surprise you with their low figures. The price of a stamp is your only cost to find out.*

# QUAKER RUBBER CORPORATION

(formerly QUAKER CITY RUBBER COMPANY)

OVER 50 YEARS CONSISTENT QUALITY

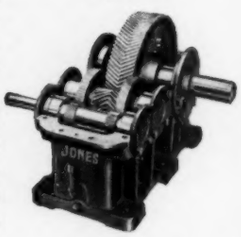
**PHILADELPHIA** · *NEW YORK* · *CHICAGO* · *HOUSTON* · *SAN FRANCISCO*

# SINGLE! DOUBLE! TRIPLE!

**—every type of Herringbone Speed Reducer that you might need**

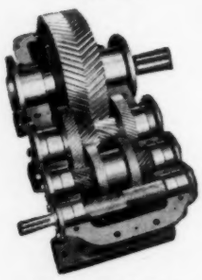
Single Reduction
Type SH

JONES Herringbone Gear Speed Reducers are built in a wide range of ratios and ratings to cover every requirement. Single (Type SH) reducers in standard ratios range from 1.25 to 1 up to 11 to 1 in ratings from 1.3 to 440 H.P. Double (Type DH) reducers are built in standard ratios from 10.9 to 1 up to 72 to 1 in ratings from 0.5 to 275 H.P. The triple reduction reducers (Type TH) cover a range of ratios from 86.9 to 1 up to 355.8 to 1 in ratings from 0.3 to 78 H.P.



Double Reduction
Type DH

All these reducers have heat treated gears, ground shafts and are mounted with anti-friction bearings throughout. Cast iron bases are available for all variations of motor assembly. Liberal stocks are carried to facilitate shipments.



Triple Reduction
Type TH

W. A. JONES FOUNDRY & MACHINE CO.
4411 Roosevelt Rd., Chicago, Ill.

HERE'S THE LATEST INFORMATION
**about the application of Herringbone Reducers**

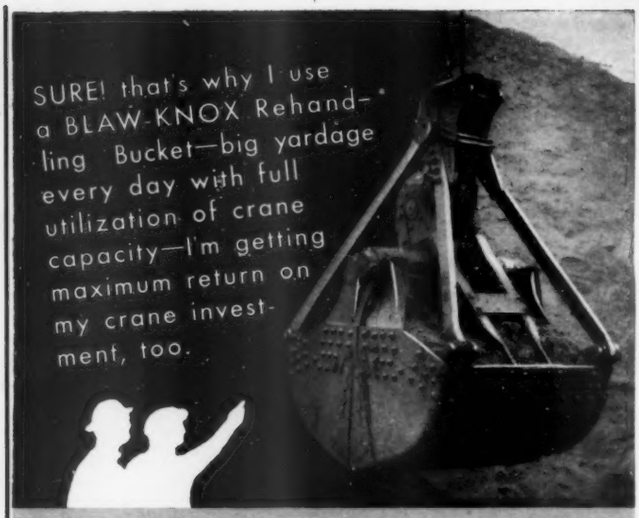
This new 128-page catalog of Jones Herringbone Reducers presents a vast amount of data relating to Herringbone Reduction Units. Illustrations show a broad range of herringbone reducer applications and the technical information shows how to select reducers for all conditions of service in accordance with the A.G.M.A. recommended practice.

**Write for your free copy of this valuable treatise**

*Since 1890*
# Jones

HERRINGBONE -- WORM — SPUR — GEAR SPEED REDUCERS
CUT AND MOLDED TOOTH GEARS — V-BELT SHEAVES
ANTI-FRICTION PILLOW BLOCKS — PULLEYS
FRICTION CLUTCHES AND TRANSMISSION APPLIANCES




SURE! that's why I use a BLAW-KNOX Rehandling Bucket—big yardage every day with full utilization of crane capacity—I'm getting maximum return on my crane investment, too.

Bulletin 1606 entitled Blaw-Knox Buckets for Contractors shows how to select a bucket to secure the profitable difference between peak and ordinary performance—it will be sent on request.

BLAW-KNOX DIVISION of Blaw-Knox Company
FARMER'S BANK BUILDING PITTSBURGH, PA.

# BLAW-KNOX
REHANDLING BUCKETS



# Confucius say:

PIT AND QUARRY
CARRY MOST
ADVERTISING
BECAUSE
PIT AND QUARRY
REACH MOST
PROSPECTS

*Examine our Type H Jaw Crusher (Bulletin 1105), and our Multi-Stage Reduction Crusher (Bulletin 113).*

# HUNDREDS of TRAYLOR TY REDUCTION CRUSHERS

in service daily testify to wide popularity of the Traylor Type TY Reduction Crusher among operators who insist upon being sure of results.

Time and again, and many times under handicapping conditions, the TY Crusher has proved that it can do more work, more satisfactorily, at less cost and lower capital outlay than previous experience with reduction crushers has shown.

Our Bulletin 2112 is fully informative. A copy will be sent immediately if you ask for it. A representative too, if you wish, and preferably!

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# EAGLE SAND AND GRAVEL WASHERS

**For all requirements in Aggregate Production**

**Dredge operators can make profits climb by using the EAGLE "Swintek" Screen Nozzle Ladder with patented nozzle head. Increases pumping capacity up to 400% by reducing delay losses. Gives constant even feed—eliminates slug pumping. Low power requirements.**

**EAGLE Single Spiral Screw Washer. Also in double screw and paddle log type.**

*Write for Bulletin*

"There is an EAGLE Washer correctly designed and built to give YOU record service and profits under *your* operating conditions"—that is the EAGLE message to the sand and gravel industry.

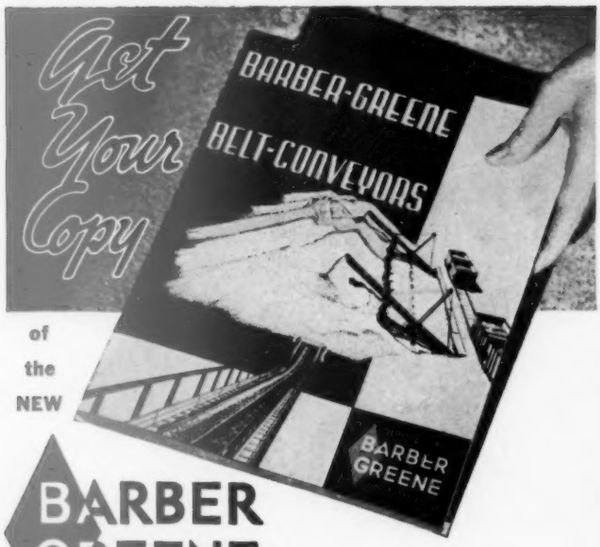
EAGLE engineers pioneered the use of Spiral Screw Washers in preparing aggregate. New models include patented and exclusive features that insure maximum production on an economy basis.

EAGLE Washers are available in Spiral Screw type and Paddle Log type. Wide range of sizes and capacities available to fit the requirements of every producer.

"To every Washing Problem, EAGLE has the right ANSWER."

## EAGLE IRON WORKS

DES MOINES, IOWA




of the NEW

BARBER GREENE

**BELT CONVEYOR CATALOG AND MANUAL**

MAIL TODAY— 37-17

Barber-Greene Company, Aurora, Illinois—Gentlemen: Send me without cost or obligation your new 116-page Belt Conveyor Catalog and Manual that not only shows the complete line of B-G *Standardized* Belt Conveyors, but has 20 pages devoted entirely to Engineering Data.

*Name*.....

*Company*.....

*Address*.....

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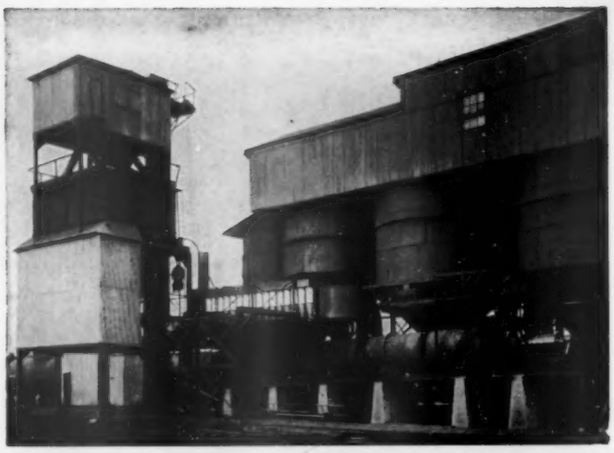


WARREN ASPHALT PLANTS

HOT MIX —— COLD MIX

— OR —

COMBINATION UNIT FOR BOTH TYPES

CAPACITY DESIGN AND ARRANGEMENT TO MEET ANY REQUIREMENTS

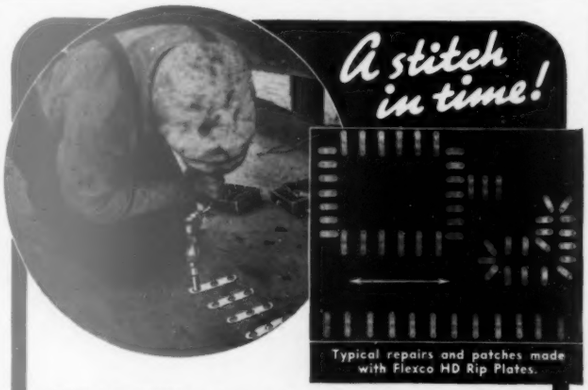
Designed and Built

— By —

WARREN BROTHERS ROADS CO.

P. O. BOX 1869

Boston Massachusetts




Typical repairs and patches made with Flexco HD Rip Plates.

THOUSANDS of men in industrial plants, mines and mills all over the country are doing just what this man is doing. They are cutting costs by repairing conveyor belts with Flexco HD Rip Plates.

*WRITE TODAY FOR BULLETIN F-100* that shows how easy it is to repair rips, to strengthen soft spots and to put in patches by using Flexco HD rip plates. The bulletin also shows how to make tight butt joints in both conveyor and elevator belts with Flexco HD Belt Fasteners. These fasteners are made in five sizes. Furnished in special analysis steel for general use and in various alloys to meet special conditions.

Flexco HD Rip Plate

Flexco HD Belt Fastener

FLEXIBLE STEEL LACING CO.

4623 Lexington St., Chicago, Ill.

FLEXCO HD BELT FASTENERS

Sold by supply houses everywhere

INSURE DRASTIC SAVINGS in Your HAULAGE OPERATIONS

A DAVENPORT INDUSTRIAL LOCOMOTIVE gives you flexible, smooth performance and easy handling *plus* important fuel economy and many-year dependability. Cut your costs and boost your profits the "Davenport Way."

These modern units are available in many types from 2½ to 100 tons. May we suggest that you submit your requirements. Our engineers will gladly develop dependable recommendations at no cost to you. You'll be surprised to know how much your Davenport can save for you. DAVENPORT LOCOMOTIVE WORKS (A Division of Davenport Besler Corporation), Davenport, Iowa.

*Write TODAY for Descriptive Catalog*

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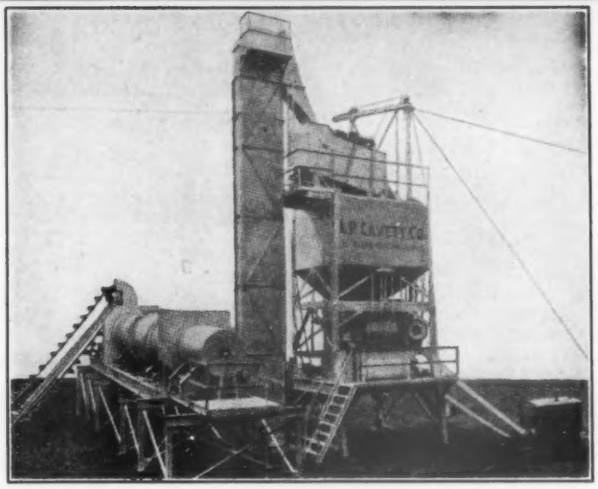
## BITUMINIZED AGGREGATE



P-A TYPE PORTABLE PLANT

MODERN STATIONARY AND PORTABLE MIXING PLANTS OFFER A NEW OUTLET FOR AGGREGATE PRODUCERS

**SEND FOR DESCRIPTIVE LITERATURE**

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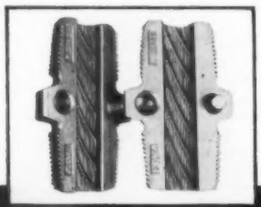
THAT'S SWELL, BOSS!
I can handle it without gloves—and the installation is a cinch!
NO MORE INJURIES
Sharp Ends are Safely Enclosed
• Streamlined for Safety—for Neat Appearance—for Security! No Fouling. Assemble it instantly, anywhere, without special tools. AND IT'S ECONOMICAL, TOO!

**TREMENDOUS HOLDING POWER!**
Look closely at this picture. Large spiral grooves grip each strand, and fine vertical grooves grip each wire! It squeezes tight; never slips and never cuts! WRITE NOW for sizes and prices—to
**NATIONAL PRODUCTION CO.**
Safe-Line Clamp Division
4599 St. Jean Avenue, Detroit, Michigan



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## WIRE ROPE CLAMP

## We'll Send You "ROPE DOPE" regularly!

"Rope Dope" is *not* an advertising medium. It is a periodical bulletin which explains simply and intelligently the highly technical phases of Wire Rope—its applications and uses . . . There's no obligation on your part—but a lot of valuable information in store for you.

WIRE—WRITE—or consult your Telephone Directory.

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## UNION Wire Ropes

The "ULTIMATE LOW COST WIRE ROPE"

B

## TRADE YOUR OLD SHOVEL — GET LOWER COSTS

It may be costing you more to keep "fixing up" that old shovel than to own a modern, efficient P&H machine. As a matter of fact, many users find that a smaller size P&H actually handles the same or even *more* tonnage than their larger, old-style models.

P&H's tough, all-welded, rolled steel construction makes it stronger, without dead weight. And smooth control gives you the ease of operation which cuts costs all around. Sizes from 3/8 to 5 cubic yards.

Write for literature on the size which interests you.

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**CORPORATION**
EXCAVATORS • ELECTRIC CRANES • ARC WELDERS P&H HOISTS • WELDING ELECTRODES • MOTORS

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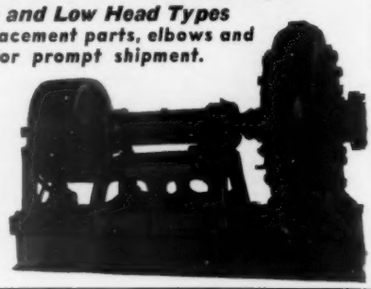
**Sand and Gravel Pumps**

***Heavy-Duty*** *(Ball-Bearing)* ***and Low Head Types***

***Complete stock of replacement parts, elbows and fittings carried for prompt shipment.***



Also clear water pumps for general service, modern design, lowest cost. High efficiency means low operating costs. Replacement parts always fit. We build abrasive material, handling pumps from 10" down to 3" in size.

**KANSAS CITY HAY PRESS CO.**
**KANSAS CITY, MO.**

**"NAT-ALOY" LOCK CRIMP MESHES ASSURE ACCURACY FOR THE LIFE OF SCREEN**

**"LONG WEARING"**

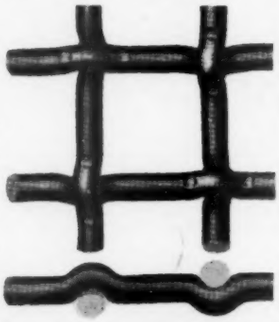
TOUGH SCREENS THAT RESIST ABRASION, WILL NOT CRYSTALIZE.

FURNISHED ALSO IN FLAT TOP AND DOUBLE CRIMP MESHES.

**Immediate Shipments from Stock**
**Attractive Prices**

**WRITE FOR NEW CATALOG NO. 51**

**National Wire Cloth Co., Inc.**
**St. Paul, Minn.**



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ANTIFRICTION or PLAIN BEARING
Made in a Complete Range of Sizes
Take-Ups, Head and Tail Pulleys, Drives

Full equipment for installation on your structure or complete stationary or portable conveyors of all types manufactured to suit your operating conditions. Quality apparatus at low cost.

**FROM MACHINES TO A COMPLETE PLANT**
Catalogs and Plans for the Asking

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**DIAMOND IRON WORKS** INC.
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CONVEYING SYSTEMS FOR PULVERIZED, FINE, CRUSHED & GRANULAR MATERIALS

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12 HUSKY MODELS TO MEET YOUR NEEDS.

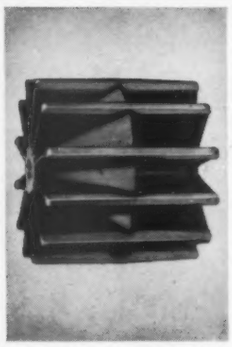
**CUT PIT COSTS**

***with economical, efficient equipment***

The heavy duty features and many operating advantages built into these sturdy, powerful, fast, convertible shovels, ⅜ to 1¼ yards, will give you increased production at lower cost. Write for Catalog H-3.

**BAY CITY SHOVELS, Inc.**
**Bay City, Mich.**

**BAY CITY SHOVELS**



***DOUBLES***

***THE LIFE OF CONVEYOR BELTS!***

The most profitable investment in conveyor equipment! A pulley that saves at least 50% on conveyor belts! This exclusive Sprout-Waldron development prevents material from coming between the face of the pulley and the belt . . . eliminates the heavy friction wear and punching of holes. Interchangeable with standard pulleys. *Write for list of sizes available.*

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***ELEVATORS, CONVEYORS, POWER TRANSMISSION EQUIPMENT***

**SIMPLICITY**
**GYRATING SCREENS**

The Leader in Improved Screening
Available in Many Standard Sizes
For Any Aggregate Grading Job

*"It's Guaranteed, without Reservation"*

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ROUND
SQUARE
SQUAROUND*
HEXAGON
**PERFORATED**
**PLATE**
of every description
for maximum productiveness from your vibrating screens.
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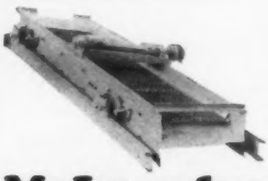

**McLanahan Equipment**

Single and double roll and jaw crushers, hammer mills, super dry pans,—steel log washers and scrubbers, sand drags, revolving and vibrating screens, elevators, conveyors, dryers, jigs, hoists,—complete portable, semi-portable and stationary crushing, screening and washing plants for different capacities of any materials.

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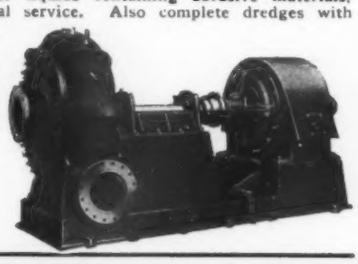
For hydraulic dredging, filling, sand and gravel production, hydraulic conveying of slurry and other liquids containing abrasive materials, clear water pumps for general service. Also complete dredges with all accessory equipment. Dredging pump designs include heavy-duty types and special alloy parts for severe service. Types and sizes for the largest or smallest operations, and for belt, motor, steam, oil or gasoline-engine drive.



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**CRUSHERS • SCREENS**

FINER PRODUCT
GREATER CAPACITY
LOWER CRUSHING COST

These advantages have made Symons Cones first among reduction crushers.

SIZES CLOSER
SAVES HEADROOM
ACTION IS POSITIVE

The trend is definitely toward level screening. Again Symons leads the way!

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ALL FORD TRUCKS, COMMERCIAL AND PASSENGER CARS CONVERTED TO *All-Wheel-Drive* IN OUR PLANT . . .

Amazing ability to perform in mud, sand, snow and on steep hills and grades. Cost less than half what you would expect to pay for a four-wheel-drive vehicle. Larger Ford trucks converted to six-wheel *All-Wheel-Drive* if desired. Write for literature.

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ARE
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BUCKET ELEVATORS
REVOLVING SCREENS
CRUSHERS DRY PANS

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**AVOID SCREEN TROUBLES THIS SUMMER!**

Steady production means a lot in your busy season. Prevent interruptions, inaccuracies, and shutdowns by using **"TWIN CITY" ALLOY SCREENS.** They stand the gaff of long, hard usage.

Order your "T. C." SCREENS *now*
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*Write for Catalog No. 39*

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No ordinary buckets are the Industrial Brownhoist Clamshells. From tip to digging teeth they are as finely built as thirty years experience and modern engineering makes possible. The result . . . out on your work . . . is bigger output, lower upkeep cost and, most important, increased profits.

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INDUSTRIAL BROWNHOIST
GENERAL OFFICES: BAY CITY, MICHIGAN
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HERE'S a new fastening for repairing your conveyor belts and power belts that gives you a snug, smooth, slip-proof joint in a jiffy. All you need are a block of soft wood, a hammer, and Bristol's Steel Belt Fasteners. Simply drive in . . . clinch points. Super-grip, too! Cold-rolled teeth embed firmly in the belt. Will not tear out, loosen up, pull away. Bristol's outlast the life of the belt! You will like that.

Send today for ample samples and informative Bulletin 72-5W that tells all about these superior fastenings for belts and conveyors of every description. The Bristol Company, *Mill Supply Division*, Waterbury, Conn. Branches in Principal Cities.

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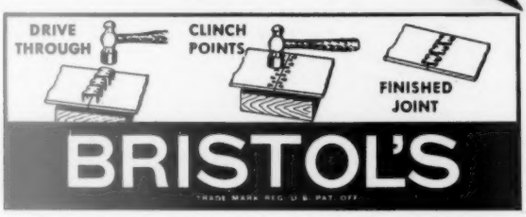


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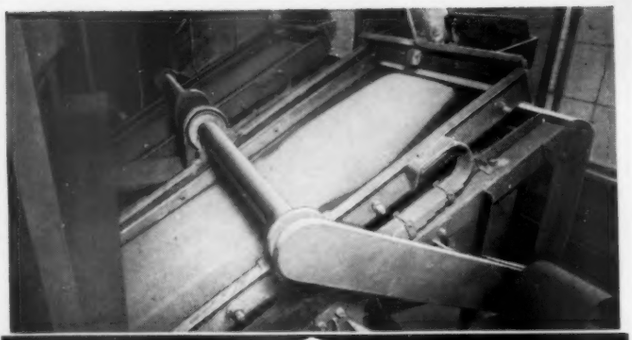

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• Link-Belt offers two general types of vibrating screens: (1) The "UP" unbalanced-pulley type for close sizing over comparatively small openings; (2) The "PD" positive drive type for larger screen openings and general heavy-duty service; both furnished in a range of sizes, single or double deck, with or without enclosures.

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125—50 ton capacity All Steel 40 foot Flat Bottom Gondola Cars for immediate inspection and shipment. Quotations gladly furnished.

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60 H.P. International Diesel Power Unit with Clutch Pulley.
Bradley Giant Griffin Mill.
30 Ton Ohio 50 Ft. Boom Locomotive Crane.
2—1240 Ft. Ingersoll-Rand XRE 3/60/2200 v. Elec. Air Compressors, New 1939.
2—8x150 Rotary Kilns.
1—5x112 Rotary Cooler.
1—4x10 Bonnot Ball Mill.
1—5 ½x20 Smidth Tube Mill, Manganese Lined.
30 x 10 Gruendler Roller Bearing Fine Reduction Jaw Crusher.
100 H.P. Coatesville Locomotive Boiler.
No. 522 Allis-Chalmers Compartment Mill.
2—6x12 Allis-Chalmers Rod Mills.

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875 Sixth Ave.
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Jaw, Roll and Cone Crushers, various sizes.
8A, 10B, 32B & 40B Telsmith, 19 Kennedy.
No. 3, 4, 6 TZ Traylor Gyratory Crushers.
Swintex Cutters 50', 10"-45', 15" pipe.
6, 8, 10 & 12" Sand & Gravel Pumps, other centrifugals.
Conveyor Equipment 14"-36", belt and Portable.
Barber-Greene Loaders, Models 42, 42A, 57.
Vibrating and Rotary Screens, all types and sizes.
2-18 ton, 2-21 ton Davenport 36" ga. Locos.
Gasoline Locos—all weights and gauges. Dump Cars.
1½ yd. Page—"C" Dragline Bucket.
90 HP Fairbanks, 110 HP Anderson Diesels.
Ask for Bulletin No. 49
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710 Eastgate Pa. 2290 St. Louis, Mo.

1—9x21 Wheeling jaw crusher..... $ 650.00
1—16x20 New Holland roll crusher..... 500.00
2—8x36 Universal crushers, each..... 850.00
1—40' Lorain 75-B boom, 1½ yd. dragline bucket and fairleads with counterweight, used only two weeks..... 1,500.00
1—Simplicity 6' soft stone eliminator with motor and V-belt drive..... 750.00

**The W. T. WALSH EQUIPMENT CO.**
3088 West 106th St. Cleveland, Ohio

**NEW CONVEYOR BELTING FOR SALE**
42" 5 ply 3/32" x 1/16" covers, 130 ft.
36" 5 ply 3/16" x 1/16" covers, 175 ft.
30" 5 ply 1/8" x 1/16" covers. 47 ft.
12" 8 ply 3/32" x 3/32" covers. 105 ft.

**BUCKET ELEVATOR BELT**
One length of 12" BUCKET ELEVATOR BELT, with 10" buckets attached. Belt is 1/16" x 1/16" rubber covered. 71 ft.

**TERRENCE P. WYNN**
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# Consider this Consolidated Equipment!

## EQUIPMENT FOR SALE AT FORMER EMERALITE ROCK PRODUCTS CO., ELY, MINNESOTA

1—24x36" Jaw Crusher, all steel.

2—8x36" Reduction type Jaw Crushers, Universal.

8—Sets of CRUSHING ROLLS: 5—24x14" Allis-Chalmers Type B; 30x14" Allis-Chalmers Type B; 2-x14" Sturtevant; 30x14" Colorado Iron Wks.; 36x16" Sturtevant.

70—ELECTRIC MOTORS, from 1 H.P. to 200 H.P., all 3/60/440 volts, including 2—150 H.P. Slip Ring.

1—Ingersoll-Rand AIR COMPRESSOR, 458 CFM., 100 lb. pressure, size 13x8x12, Imperial Type 10-XRB, two-stage, with inter-cooler, 79 H.P. Westinghouse 3/60/440 Motor.

1—7x6 Type ER-1 Ingersoll-Rand AIR COMPRESSOR, V-belt drive, and 15 H.P. Motor.

1—1¼ yd. OSGOOD ELECTRIC SHOVEL, 21′ boom, 16′ dipper handles.

3—DIRECT HEAT ROTARY DRYERS: 5x30′ Buckeye and 4x30′ American Process oil burners. Also 4x40′ Ruggles-Coles.

3—ELECTRIC HUMMER SCREENS, W. S. TYLER CO.; 3x5′ No. 33; 4x5′ No. 33; all double deck.

4—3x6′ STURTEVANT MOTO-VIBRO SCREENS, double deck, arranged two in battery, side by side.

1—4′x7′ LEAHY VIB. SCREEN, double deck, encl.

1—150 Amp. Lincoln ELECTRIC WELDER, portable.

1—No. 5 Ingersoll-Rand DRILL SHARPENER.

8—BUCKET ELEVATORS, various sizes, enclosed. Also much other equipment, thoroughly described in illustrated circular. Representative, with authority to sell, on the premises. Inquiries addressed to Consolidated Products Co., Inc. P. O. Box 180, Ely, Minn. will bring immediate quotations.

## 7 FT. SYMONS CONE CRUSHER, FITTED WITH FINE BOWL FOR IMMEDIATE SHIPMENT AT A LARGE SAVING

Some Special Items:

2—No. 55 Raymond Imp Mills, each with 60 H.P. Motor and Separator.

1—No. 40 Raymond Imp Mill with 50 H.P. Motor and 6′ Centrifugal Air Separator.

6—4′x7′ Leahy Vib. Screens, 2-deck, motor driven.

2—INDIRECT HEAT ROTARY DRYERS, CHRISTIE, 70″x40′, 80″x65′.

1—MARION No. 351 CRANE, gas. 4 years old. Used six months.

1—MARION No. 451 ELECTRIC SHOVEL, 3 motor type, 1¼ yd.

2—BROWNING LOCOMOTIVE CRANES No. 8-C, 25 ton capacity, 50′ booms.

1—DIESEL POWER UNIT, 60 H.P., Int'l., Model PD-40, complete.

1—BUCYRUS-MONIGHAN No. 6W DIESEL DRAGLINE, 6 yd. bucket, 150′ boom.

1—No. 55B BUCYRUS-ERIE DIESEL DRIVEN SHOVEL, 2½ yd.

1—527 CFM GARDNER-DENVER COMPRESSOR, V-belt, Cat. Diesel D-13,000.

1—1300 CFM I-R PRE-2 COMPRESSOR.

1—315 CFM SULLIVAN WT-60 Cat. Diesel, D-13000.

1—CATERPILLAR RD-7 DIESEL TRACTOR with LAPLATE CHOATE BULLDOZER.

**We have also purchased and are now liquidating a complete 1,000,000 barrel Portland Cement plant at Castalia, Ohio — 60 miles west of Cleveland.**

## SOME OF THE ITEMS IN THIS PLANT ARE:

8x125′, 6x120′ and 6x60′ ROTARY KILNS.

1—4′6″x50′ Direct Heat Rotary Dryer, double shell.

1—4x60′ DIRECT HEAT ROTARY DRYER.

3—5x12′ BONNET BALL MILLS, each with 150 H.P. motor.

6—5x20′, 5x22′ TUBE MILLS; each with 150 H.P. slip ring motor.

1—8′x30″ HARDINGE CONICAL BALL MILL, iron lined.

6—5′x27′ TUBE MILLS, silex lined, with 250 H.P. slip ring motors.

1—12′ dia. DRY GRINDING PAN.

400—1½ yd. two-way DUMP CARS, 36″ gauge.

2—42″ FULLER-LEHIGH PULVERIZERS, gear driven.

2—6′x5′ TYLER HUMMER SCREENS, made up of 3x5′ screens.

1—5 ton TRAVELING CRANE, 70′ span, 300′ long.

1—20 ton BROWNING LOCOMOTIVE CRANE.

1—COMPLETE MACHINE SHOP.

Approx. seven miles of 40 lb. and 60 lb. RAIL.

Send to Consolidated Products Co., Inc., P. O. Box 545 Sandusky, Ohio for detailed circular or quotations

## CONSOLIDATED PRODUCTS CO., INC.

**17-19 PARK ROW — NEW YORK, N. Y.**

***Our Shops at Newark, N. J., cover eight acres***

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## Crushers and Screens

Jaw Crushers: 9x15, 9x16, 10x20 and 12x18.
Farrell type B 24x36 Jaw Crusher.
Robins 28x30 Geared Corrugated Roll Crusher.
Telsmith 30″ Steel Encased Rotary Grizzly.
3x5 Multirap 1-d. Dry or Wet. Vib. Screen.
3x8 Link-Belt 1-d. Vib. Screen.
4x5 Hummer 1-deck Vib. Screen, V-40 Head.
4x8 Hummer 1-deck 2-unit Vib. Screen, 2-V16.
120 New 3x5 and 4x5 Ton-Cap. Screen Frames.
2—4x8 Perfex Shaking Heavy Duty Screens.
2—4x8 Gyrex Vibr. 2-deck Screens.

## Conveyors and Elevators

36″ Link-Belt Self-Contained Apron Feeder.
Belt Conveyor Equipment, 12″ to 36″ wide.
24″ B-G Reciprocating Plate Feeder, elec.
18″ Haiss Digging Bucket Loader, on wheels.
18″x30′ Portable Trough Belt Conveyor.
16″x20′ Portable Trough Belt Conveyor.
2 Belt Conveyors 12″x 80′ and 12″x 50′.
2 Belt Conveyors 24″x200′ and 24″x100′.
2 Belt Conveyors 30″x125′ and 30″x100′.
24″x40′ and 20″x50′ Cont. Inclined Elevators.
14″x50′, 13″x40′ and Cont. Incl. Elevators.
10″x40′ Bucket Elevator, on Chain.
6″x30′ Encased Belt Bucket Elevator.
Chains, Buckets, Casings, Drives, Pulleys.

## Miscellaneous

12 KVA Tyler 1-ph. Generator, for Screens.
I-R Steam Air Compressor, 12x12x12.
173′ and 45′ Belted Air Compressors.
50 and 60-hp. Waukesha Gas Engines, clutches.
2-drum Stroudsburg Builders 9-hp. Hoist.
¾-yd. Erie Steam Shovel Front and Dipper.
12 Centrifugal Electric and Belted Pumps.
Clamshell Buckets: ¾, 1, 1¼ and 2½ yards.
Railway Equipment: 11 New 24″ g. 1-yd. Cars.

**G. A. UNVERZAGT**

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LORAIN 75-A 1¼ yd. Shovel No. 3929.
Northwest No. 105 1 yd. Shovel No. 1540. $1850.00.
Northwest Mod. 18 ½ yd. Shovel No. 4408. Like New.
Bucyrus-Erie GA-2 1¼ yd. Shovel No. 4046. $1750.00.
Lima No. 101 15 ton Crane. Excellent Condition.
P&H Model 400 ¾ yd. Shovel No. 3953. Rebuilt.
3—Link-Belt K-55 Draglines 70′ Boom.

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2—Chicago-Pneumatic 15x9x10 Compressors direct con. Benz 40D 120 HP Diesel Eng. 664′ ea. Like New, comp. with all accessories and ready to work.
Ingersoll-Rand, Mod. 420 Portable. Actual Cap. 413′ at 100 lb. Used less than SIX MONTHS. New Guarantee. Bargain.

Whitcomb 4 ton Gas Loco., 24″ Ga. Like New. $395.00.
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2—Owen ¼ Type M Clamshell. Almost new.
1—Hayward 1 yd. Rehandling Clamshell.
30—C.P. No. 5 DRIFTERS comp. with shells and screws. $100.00.

**CHARLES DREIFUS COMPANY**

**Widener Building — Philadelphia, Pa.**

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Concrete batching plant, 5 compts., 1000 yds. aggregates, 750 yds. cement, automatic weigh batcher.
Robinson bulk cement unloader, air.
225 bbl. Erie bulk cement plant, complete.
155 bbl. Fuller cement bin, electric batcher.
Blaw-Knox 270 bbls. bulk cement plant, complete.
72 ton Blaw-Knox steel bin, portable, 2 compts.
50 ton Blaw-Knox steel bin, portable, 2 compts.
42 cu. yds. Beaumont steel bin, 2 compts.
Fuller Kinyon bulk cement unloader, portable.
Fuller C40 rotary air compressor, electric.
Gyratory crushers: K.V.S., 30, 37-S, 49; Telsmith 32, 8A, 8B; Traylor 8″; McCully 13″, 8″, 6″.
Jaw: 6x12, 9x16, 10x20, 12x26, 13x30, 18x36, 24x36.
Jeffrey type A 30″x24″ pulverizer.
Apron feeders, 18″x6′, 24″x6′, 48″x14′, 5′x15′.
Bucket elevator, 65′, chain, buckets 24″x12″x17⅝″.
Revolving screens, 72″x20′, 72″x18′, 60″x24′.
Robins 4x8 double deck Gyrex vib. screen.
Telsmith 4′x10′ single deck vibrating screen.
Whirley, 25 tons cap., 85′ boom, electric.
43-B Bucyrus-Erie Diesel 2 yd. shovel.
41-B Bucyrus-Erie comb. crane and shovel. Steam.
50-B Bucyrus-Erie steam shovel.
Browning 10 ton crane, gas, 40′ boom.
Blaw Knox single line clamshell bucket, ¾ yd.
Haiss clamshell bucket, 1½ yd. rehandling.
Barber-Greene conveyor, 24″x70′.
8 Barber-Greene conveyors, 24″x35′, type N.
Barber-Greene conveyor, 18″x60′.
4 I.R. Wagon drills, FM-2, pneumatic tires.
I.R. quarry bar, complete with I.R. X71 drill.
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Plymouth 24 ton std. gauge gas locomotive.
Plymouth 20 ton std. gauge gas locomotive.
Vulcan 6 ton 36″ gauge gas locomotive.
Vulcan 4 ton 36″ gauge gas locomotive.
Dredge pumps, 6″, 8″, 10″, 12″, 16″.
8″x6″ cent. Lawrence pump, portable, 35 HP, gas.
8″x6″ cent. Barnes pump, portable, 35 HP, gas.
6″x5″ Lawrence pump, 20 HP, electric.
4″x4″ cent. LaBour self priming pump, 15 HP, elec.
I.R. Type 20, 310 cu. ft. air compressor. Portable.
DeWalt woodworker, 16″ circular saw, electric.
Stiff leg derrick, steel, 30 tons, 97′ boom.
Steam hoist, 10″x12″, 3 drums, Lidgerwood.
Stiff leg derrick, steel, American, 15 tons, 90′ bm., with 3 drum American 125 HP electric hoist & swinger.
Clyde 3 drum electric hoist & swinger, 75 HP.
Lidgerwood, 2 drums, swinger, gas hoist, 75 HP.
Sauerman two drum dragline Hoist, 75 HP. gas.

**RICHARD P. WALSH, 30 Church St., New York, N. Y.**

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**Jaw Crushers—4″x8″ up to 66″x84″.**
**Crushing Rolls—16″x10″ up to 54″x24″—Gyratory Crushers**
**Ring Roll Mills—No. 0 and No. 1.**
**Swing Hammer Mill.**
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**Direct Heat Rotary Dryers—3½′x25′, 4′x30′, 5′x30′, 5½′x40′, 6′x50′, 7′x50′ and 8′x50′.**
**Semi-Indirect heat Dryers—4′x30′, 4½′x26′, 5′x30′ and 8½′x75′.**
**Cement Kilns—3′ up to 8′ diameter.**
**Hardinge—Marcy & Fuller-Lehigh Mills.**
**Raymond Mills—No. 00, No. 0 and No. 1 and No. 5 roll**
**Tube—Rod and Ball Mills—3′ to 8′ diameter.**
**Vibrating Screens—Air Separators.**
**1—4′x4′ Ball Mill.**
**New Dryers built for all purposes.**

**W. P. HEINEKEN**

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1—Houston Stanwood & Gamble 70 H.P. Horizontal Tubular Steam boiler, in good condition.

1—Ledgerwood 10x12 Steam Hoist.

1—New Fairfield Engineering Hoist with overhead conveyor for unloading coal or bulk material in bins.

1—Koehring 22-E 1 yard mixer. Tractor and mixer in good shape. Priced right for cash sale.

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**Marietta, Ohio**

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75 HP, 720 RPM, 3/60/220, General Elec. MT.
100 HP, 720 RPM, 3/60/220, Westinghouse CW.
150 HP, 720 RPM, 3/60/2200, General Elec. MT.
150 HP, 600 RPM, 3/60/220, Westinghouse CW.
400 HP, 600 RPM, 3/60/2200, Westinghouse CW.

## TRANSFORMERS

3—100 KVA, 2200—110/220 V. Gen. Elec. Type A.

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85 KVA, 1200 RPM, 3/60/240, Allis-Chalmers.
150 KVA, 600 RPM, 3/60/240, General Electric.
300 KVA, 600 RPM, 3/60/240, General Electric.

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5 KVA, 3/60/220 V. AC generator—LeRoi engine.

## DIESEL ENGINE

100 HP, Fairbanks-Morse type Y style V. Complete.

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12″ Cameron Volute 4170 GPM, 170′ head, 250 HP, 3/60/440 V. Gen. Elec. slip ring motor.

## AIR COMPRESSORS

9x8 Chicago Pneumatic type NSB 173 CFM, 100 lb.
10x9 Sullivan class WG3 horizontal 200 CFM, 100 lb.
17 & 10x14 Ingersoll-Rand Imperial type 10 two stage, 677 CFM, 100 lb. complete.

**ROCKFORD ELECTRIC EQUIPMENT CO.**

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Universal truck crane on Mack truck.
Koehring No. 501 dragline, rebuilt.
Several Byers Bearcat cranes.
Sullivan 315 ft. compressor; exc. condition.
45 H P Continental and Wisconsin engines.
International TD-18 tractor, used 6 months.

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**All sections new and relaying rail, spikes, bolts, frogs, switches, "V" Shaped, flat and Contractors' Cars, etc. Prices cheerfully quoted.**

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25 ton Plymouth Gasoline Locomotive, New 1932.
25 ton Gasoline Locomotive Cranes, 4′8½″ Ga.
1 yd. & 1¼ yd. P&H Cranes & Draglines.
20″x200′ Sullivan Troughed Belt Conveyor.
80, 100, 120, 180, 240 HP Fairbanks Morse and Atlas Diesels. Generators if required.
180 HP Fairbanks Morse Dredge type Diesel.

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**501 Locust St. — St. Louis, Mo.**

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1—Vulcan 40 ton Std. Ga. Saddle tank locomotive.
1—Marion 1 yd. Steam crane 40′ boom on cats.
1—Russell Grader, 10′ Blade.
1—Link-Belt K-30, Trench Hoe Att. 45′ Crane Boom.
1—Link-Belt K-44 shovel 50′ boom, fairleads.
1—Lorain 75 B 1¼ yd. chain crowd shovel.
2—Whitcomb 12 Ton 36″ Gauge Locomotives.
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1—Sullivan 310′ portable compressor.
1—Ingersoll-Rand pavement breaker.
6—Easton 4 yd. all steel 36″ Ga. cars.
4000′ of 9″ x 9″ road forms.
1—Ransome 27 E Paver.
2—No. 116 Chicago Pneumatic Paving Breakers.
2—1 yd. Insley bottom dump concrete buckets.
1—Schramm No. 120 Compressor.
1—1 yd. Owen Bucket.
1—1 yd. Kiesler rehandling bucket.
1—¾ yd. Browning clamshell bucket.
1—¾ yd. Blaw-Knox bucket.
1—Le Courtney 6″ Cent. Pump, 40 h.p. motors.
1—Morris 8″ dredge pump, 150 h.p., G.E. motor.
1—Morris 10″ cent. pump, 2250 GPM at 130′ head.
1—Goulds 12″ cent. pump, 50 h.p. G.E. motor.
1—Thompson 6″ self-priming pump, Waukesha motor.
2—Gardner Denver Sheeting Hammers.
2—Humdinger 6″ self-priming pumps, gas motor.
1—Humdinger 4″ self-priming pump.
1—Humdinger 2″ self-priming pump.
1—Domestic double diaphragm pump, gas motor.
1—G.E. motor, 200 h.p. slipring.
2—No. 9 B 2 McKiernan-Terry Hammers.
3—No. 5 McKiernan-Terry Hammers.
3—No. 7 McKiernan-Terry Hammers.

**HARRY C. LEWIS**
325 Frelinghuysen Avenue — Newark, N. J.

## RECONDITIONED EQUIPMENT

One 80 H.P. Lambert electric three drum hoist, $1200.00
Three 80 H.P. Lidgerwood electric two drum hoists with attached swingers, $900.00 each
Two 72 H.P. Thomas gasoline two drum hoists, $1000.00 each
One 60 H.P. Thomas electric three drum hoist, $975.00
Three Lambert 60 H.P. electric two drum hoists with attached swingers, $800.00 each
One 40 H. P. Thomas gasoline two drum hoist with attached swinger, $650.00
Two Thomas 35 H.P. electric two drum hoists with attached swingers, $600.00 each
One Clyde 25 H.P. electric two speed drag scraper hoist, $500.00
One Sullivan 315′ two stage gasoline portable air compressor, $1800.00
Three Sullivan 310′ gasoline portable air compressors, $650.00 each
Two Sullivan 220′ gasoline portable air compressors, $600.00 each
Two 20 ton American Terry No. 3 guy derricks, with 90′ boom, 80′ mast, $1500 each
One 24″ Portable belt conveyor, 40′ long $600.00

**Crane Type Motors**
3 and 2 phase, 60 cycle, 220 or 440 volts

125 H.P. G.E. 720 R.P.M. $750.00
100 H.P. G.E. 900 R.P.M. $600.00
80 H.P. G.E. 720 R.P.M. $450.00
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Large variety of controllers, resistors, switches

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Serving the Construction Industry for 47 Years
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3—5′x50′ Rotary Dryers.
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2—Style "D," Size 3-K, 4-K Gates Crushers.
1—Allis-Chalmers 5′x8′ Steel Ball Mill.
2—Jaw Crushers 22″x10″, 4″x8″.
5—Crushing Rolls 42″x16″, 12″x24″, 14″x24″.
1—Raymond Mill, high side 3 roll.
1—Jeffrey Hammer Mill, type "B," 24″x20″.

Your Inquiries Solicited

**BRILL EQUIPMENT CORP.**
183 Varick St.
N. Y. C.

## FOR SALE
## USED EQUIPMENT

10x20 DIAMOND Roller Bearing Jaw Crusher.
10x36 DIAMOND Roller Bearing Jaw Crusher.
15x36 DIAMOND Roller Bearing Jaw Crusher.
2′0″x4′0″ single deck DIAMOND vibrating screen.
6 to 8 HP model MRP3 LeRoi Engine.
Model No. U-40 Allis-Chalmers Engine.
4″ Sterling Sand pump No. 3558.
60″x20′x0″ Revolving screen — Structural frame on wheels.

## NEW EQUIPMENT

1—DIAMOND 9x16 Bronze Bearing Jaw Crusher mounted on truck with 15-20 HP engine.
3′0″x8′0″ Triple deck Diamond Vibrating Screen.
21-Cu. yard jack leg bin.
Special Price for quick sale.

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## !! PLAY PERCENTAGE !!

**Buy Good Modern Equipment from Atlantic**

## SAVINGS UP TO 50%

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1—Ingersoll-Rand 1302 cu. ft. 100 lb. pressure. Cylinders 20x12½x12. New 1939. With or without power.
1—Gardner-Denver 1051 cu. ft. 100 lb. pressure. Cylinders 18x11x14. New 1939.
2—Chicago Pneumatic 1300 cu. ft., electric, direct connected.
1—Ingersoll-Rand, 676 cu. ft., cylinder size 15x9¼x12. Belted. With or without electric power.

**BOILERS**

1—100 H.P. Coatesville Locomotive Type ASME.
4—Vertical Boilers from 25 to 50 HP. All ASME.

**BUCKETS**

6—Owen Clamshell, from ¾ to 1½ cubic yard.
2—¾ yard Hayward Orange Peel.
2—Hayward Dwarf Orange Peel Buckets. Several dragline buckets from ¾ to 3½ cubic yard.

**BELT CONVEYORS**

1—Barber Greene portable, 24″ belt, 40′ centers, gasoline powered.

**CRANES, DRAGLINES AND SHOVELS**

1—Bucyrus-Erie Diesel, two yard combination crane, dragline and shovel.
1—Link-Belt Model K-55 gasoline dragline. 2½ yard bucket. 70′ boom.
1—Koehring Model 501 gasoline, combination shovel and crane 1¼ yard.
2—Lorain 75-B. 1¼ yard.
1—Industrial Brownhoist Crane. Gasoline. 60′ Boom. 16-tons capacity.
1—Little General Shovel. Gasoline ½ yard dipper.
1—Browning 25-ton steam locomotive crane, 50′ boom.

**CRUSHERS**

2—9x15 Jaw Crushers. Brand new.

**DERRICKS**

1—Terry steel stiff leg derrick. 87′ boom. 60-tons capacity at 40′ radius.
1—American Steel Stiff Leg Derrick. 80′ boom. 15-tons capacity maximum radius.
4—American Steel Guy Derricks, 115′ masts, 100′ Booms. 15-tons capacity maximum radius.

**HAMMERS**

1—No. 1 Vulcan (Pile). Shop No. 2275.
1—No. 2 Vulcan. Shop No. 2290.
1—9B3 McKiernan-Terry. Brand new. Never used.
2—10B-3 McKiernan Terry. Shop. No. 8500 series.
1—11B-3 McKiernan Terry. Shop No. 8700 series.

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1—100 H.P. 2-drum Lambert with attached swinger. Gasoline.
1—50 H.P. Double Drum Mundy. Gasoline.
1—35 H.P. Double Drum Lidgerwood. Gasoline.
1—10x12 3-drum Lambert Steam. With space for boiler.
1—11x12 3-drum American. Steam. With banked levers. Oil fired boiler.
1—9x10 Lidgerwood. Double Drum. Steam.
1—9½x12 Lambert. Double Drum. Steam.

**LOCOMOTIVES**

3—8-ton VULCAN. Standard gauge. Gasoline.
1—14-ton PLYMOUTH. Standard gauge. Gasoline.
3—20-ton PLYMOUTH. 36″ Gauge. Gasoline.
1—8-ton PLYMOUTH. 36″ Gauge. Gasoline.

**PAVER and MIXERS**

1—Koehring Model 27-E. No. 2A, with boom and bucket discharge.
1—10-S Koehring. New. Never used.

**PUMPS**

12—Self Priming. All gasoline driven pumps, ranging in size from 3″ to 10″.

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1—5-ton Austin Pup, with scarifier, 3-wheel.
1—10-ton Austin, with scarifier, 3-wheel.

**TRACTORS**

1—Model 20, Caterpillar, Gasoline.
1—RD-6, Caterpillar Diesel, with bulldozer.
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1—RD-8, Caterpillar Diesel, with 12 yd. LeTourneau Scraper.

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GYRATORY: 42″ McCully with 80% brand new parts. 36″ Allis-C. 20″ Super. McCully conv. to 10″. Gates Nos. 10, 9, 8, 7½, 6, 5, 4, 3, 2, 1 (75 avail.) Telsmith Nos. 4, 5, 6, 8C, 9 & 16. Also many Austins, Kennedys and Traylors, many sizes.

JAW TYPE: Traylor 60x84, 48x60, 42x48, 24x72. Superior 84x66 & 24x36. Buchanan 30x42. Farrel 60x42, 30x36, 24x36, 18x36, 12x24. Good Roads 1030. Acme 24x40. Misc. 7x12, 9x16, 8x20, 8x24, 12x24, 9x36, 9x30, 15x36.

REDUC. TYPE: Kennedy Nos. 25, 37 & 49. Telsmith 3-F & 40. Traylor 36″ TZ, 8″, 10″, 12″. Super. McCully 6″ & 10″. Newhouse 5, 7 & 10″. Symons Cone & Disc. Ty. 2′ to 4′.

ROLLS: Allis-C. 12½x12, 36x16, 40x15, 54x24 & 72x30. Fairmount 36x60 & Jeffrey 24x24 to 36x54 single roll. Cornish 36x14 & 42x16. Etc., Etc.

HAMMERMILLS: Williams Nos. 1, 2, 3, 4, 6 & 9. Jeffrey 36x18 & 36x42. Day Nos. 20 & 40, Etc.

MILLS: Kennedy Ball 4x6, 5x6 & 5x8. March 8x6 & 10x9. Hardinge 6′x3′, 8′x30″ & 6′x9′. Misc. Tube Mills 5′ & 6′x22′. Sturtevant Ring Roll, Raymonds, Kents, Fuller-Lehigh, Etc., Etc.

CRUSHING PLANTS: No. 65 Diamond. No. 22 Pioneer 8x24. 1030 Good Roads, 9x40 Austin-Western, 9x36 C.R.

**MISCELLANEOUS ITEMS**

Barges, Bins, Buckets, Boilers, Cableways, Cars, Compressors, Conveyors, Cranes, Dryers, Derricks, Draglines, Drag Scrapers, Dredges, Drills, Engines, Elevators, Excavators, Generators, Hoists, Kilns, Locomotives, Loaders, Motors, Pipe, Pumps, Rail, Scales, Screens, Slacklines, Shovels, Tanks, Trucks, Tractors, Etc., in many sizes, types and makes at low prices.

(I have equipment at many points in the United States and Canada. What you need may be near your plant.)

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## PRICED FOR QUICK SALE

1—48″ Symons Horizontal Disc Crusher (Nordberg Mfg. Co.), completely overhauled, rated capacity 1″ product, 45-60 T.P.H. ..... $1,000.00
1—8″ Allis-Chalmers Style N Gyratory Crusher, No. 7715, like new; used only one season. Manganese fitted, non-choking concaves, smooth head for fine crushing, extra head for coarse crushing ..... $850.00
1—No. 2 Allis-Chalmers Gyratory Crusher, manganese fitted ..... $250.00
1—Allis-Chalmers Eccentric with manganese steel gear for No. 5 style K crusher, like new.. $150.00
1—30″x16″ Wis. Foundry Crushing Rolls... $450.00
1—24″x14″ Wis. Foundry Crushing Rolls... $275.00
Several Vibrating Screens, Bucket Elevators, Sand Classifiers, Electric and Gasoline Motors, 2″, 3″, 4″, 6″ Self-priming centrifugal pumps with gasoline motors; 1½″, 2″, 3″, 4″, 6″ centrifugal pumps with electric motors.
1—Portable Air Compressor, on pneumatic tired wheels, 160 c.f.m. actual air.
1—Portable Air Compressor, on pneumatic tired wheels, 105 c.f.m. actual air.
Above compressors are like new, have been used only a few months.
1—Link-Belt Shovel Boom Assembly with 1 yard Amsco dipper, excellent condition, will fit models K1, K2, K35, K42.
1—Northwest ¾ yard Shovel Boom Assembly for Model 104-105.
1—P&H ¾ yard Shovel Boom Assembly for Model 206.

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CRANE—Steam McMyler 20 ton capacity, double drum, bucket operating, 50′ boom. Good condition.

LOCOMOTIVE — Steam, American 40 ton, four wheel, saddle tank, overhauled.

MIXER—Smith tilting type 56 S. two cubic yard capacity concrete mixer, excellent condition.

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Freight Car Replacement Parts.
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Portable and stationary, belt with elec. or gas power, sizes from 20 cu. ft. to 1,000 cu. ft.

**BINS**

9—1—118 ton Blaw Knox; 2—85 ton Heltzel; 1—60 yard Butler V-60; 1—72 Blaw Knox; 1—60 ton Butler V-40; 2—35 ton Blaw Knox; 1—26 ton Heltzel with Kron-dial scale. All above with or wi hout volume or weigh batchers.

1—Bulk Cement Handling Plant with Johnson 300 bbl. bin. Jeffrey elevators, portable.

**BUCKETS**

26—Clamshell, all sizes and types; Williams, Blaw Knox, and Owen.

6—Dragline: 1—1¾ yd. Northwest; 1—1½-yd. Omaha; 1—1¼ yd. Page; 2—1 yd. Hayward; 1—¾ yd. Page.

1—1½ yd. Pioneer Cableway Excavator bucket.

7—Dragscraper: 2—1 yd. Sauerman; 1—1 yd. Green; 1—¾ yd. Garst; 2—½ yd. Garst.

**CONVEYORS & ELEVATORS**

4—Steel frame belt conveyors: 3—18" Barber-Greene 60', 45' & 24'; 1—National 18"x30'.

11—Bucket elevators: Rex and Weller on chain or belt; all sizes.

**CRANES, DRAGLINES & SHOVELS**

1—Link Belt Mod. K-55 combination dragline and shovel Ser. No. 1698, gasoline power, 70' dragline boom, 2 yd. shovel front.

1—Page, Model No. 411 Diesel crawler dragline, 70' boom, 2 yd. bucket.

1—P & H Model No. 650, Serial No. 4188, 65' boom; 1¼ yd. bucket.

1—Link-Belt K-42, combination shovel, crane and trench hoe. Serial No. 1265, 1¼ yd. shovel front, 60' crane boom.

3—Northwest, Model No. 105, Serial Nos. 2053, 1645 and 1522, 40' boom, 1 yd. bucket.

1—Link-Belt, K-1, Serial No. 1024, 50' boom, 1 yd. bucket.

2—Osgood Heavy Duty, Serial No. 2069 and No. 2087, combination 1 yd. shovel and crane, 40' boom.

2—Thew, Model "O" combination shovel crane and dragline, Serial No. 2801 and No. 2687, ¾ yd. shovel fronts, 40' crane boom.

1—P & H Model No. 206, 40' boom, ¾ yd. bucket.

1—Byers Bearcat, Serial No. 3299, 30' boom, ½ yd. bucket.

**CRUSHERS**

6—Jaw Crushers: 1—12 x 26" Champion; 1—12x20" Acme; 2—10"x20" Climax No. 2½; 1—9x16" Telsmith No. 9A; 1—9x15 Champion.

3—Gyratory: No. 5 Gates; 1 No. 3 McCully; 1—No. 0 McCully.

1—Set of Allis Chalmers, smooth type crushing rolls, 42x16".

**DREDGE PUMPS**

1—12" Morris Heavy Duty D. C. to 100 H.P. dbl. cyl. steam engine.

3—Belt Driven: 3—Morris Mang., 1—10", 1—8", 1—6".

**HOISTS**

1—2 yd. Thomas 2 speed Class I, Cableway excavator hoist with 150 HP electric motor.

1—1 yd. Cedar Rapids 2 speed dragscraper hoist with 50 HP electric or gas power.

**WHIRLEY**

1—Mod. 75 Wiley Whirley No. 2973, 20 tons cap., 75' boom, 3 D Clyde 80 HP elec. hoist and 30 HP elec. swinger, all complete. Perfect condition.

*Please Send for Complete Stock List*

## EQUIPMENT CORPORATION OF AMERICA

1505 Race St., Philadelphia; Phone Rittenhouse 4664 — 1160 S. Washtenaw Ave., Chicago; Phone Nevada 2400 — P. O. Box 933, Pittsburgh; Phone Federal 2000

## REBUILT 5 YARD TRANSIT TRUCK MIXERS

Mounted on A.C. 4 speed Mack Trucks. Equipped with all new rubber 11.25 x 24 in the rear and 9.75 x 24 in the front. These machines have all been completely rebuilt according to the latest specifications, and are equal to the latest designed machines on the present market. These mixers load from the top, mix while in transit and automatically eject the materials from the rear. The fittings are manufactured by the JAEGER COMPANY. We are in a position to demonstrate these machines in operation. For further information wire or write.

**EVERYTHING FOR THE CONTRACTOR**

*If it is something that a contractor can use we have it at a very great reduction price.*

## BROOKLYN CONTRACTORS MACHINERY EXCHANGE, INC.

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## FOR SALE

COMPRESSOR—Sullivan angle compound 13-8x8, capacity 406 c.f.m., mounted on structural steel base and skids, with A.C. Wagner 220 volt, 3 phase 60 cycle motor. Excellent condition.

POWER UNIT—Waukesha Model HLU 4 cylinder 82 H.P. 6x6½ gasoline engine, skid mounted, with sheet metal hood, air, fuel and oil filter, clutch, gas tank and belt pulley. Practically new.

**Write for our complete list**

**O. B. AVERY COMPANY**

1325 Macklind Ave. — St. Louis, Mo.

Farrell Jaw Crushers: 24x36, 18x36, 15x36, 10x36, 6x36, 13x24, 10x20.
Buchanan Jaw Crushers: 18x36, 15x30.
Telsmith Jaw Crusher: 11x22.
Allis-Chalmers Jaw Crusher: 35x60.
1020 and 1030 Good Roads Roller Bearing Jaw Crusher.
Allis-Chalmers Gyratory Crushers: 12K, 7½K, 6K.
6" Traylor Gyratory Finishing Crusher.
No. 1 Williams Jumbo Junior Hammermill.
14"x30" Sturtevant Rolls.
15"x30" Buchanan Rolls.
1—105 Cu. Ft. Gardner-Denver Two Stage Air Compressor.
2—110 Cu. Ft. Ingersoll-Rand Air Compressor.
2—360 Cu. Ft. Schramm Air Compressors.
1—1½ Yd. Koehring Shovel.
1—1 Yd. Byers Shovel.
1—Haiss Bucket Loader.
1—Model 42 Barber-Greene Bucket Loader.
1—10 Ton Case Roller.
2—10 Ton Huber Rollers.
3—100 HP, 550 Volts Vertical Motors.

**BLUE BALL MACHINE WORKS**
**BLUE BALL, PA.**

## Excellent Used Equipment Bargains

1—Northwest Model 104, 1¼ Yd. Crane and Dragline, 45' boom, latest style crawlers, completely rebuilt, guaranteed good mechanical operating condition.....$5,500.00

1—P&H Model 150, ½ yd. Crane, used about three months, practically like new, guaranteed condition .....$3,500.00

1—Browning 35 ton Locomotive Crane, good operating condition .....$4,300.00

1—Cedar Rapids 9x16 Jaw Crusher, new jaws, excellent condition. .....$725.00

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**UNUSUAL ITEMS . . . . . UNUSUALLY PRICED!**

1—6½-yd. Bucyrus 320-B Electric Shovel.

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12—50-ton Covered Hopper Cars.

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Motors and Generators, A.C. and D.C. for sale at attractive prices. New and Rebuilt. All fully guaranteed. Write for List and Prices.

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**FOR SALE**

Very cheap, steel boat 34x20, is in sections, can be trucked anywhere. One 10 inch Amsco pump; motor, drum control, grids, oil circuit breaker. All in excellent condition. Will sell all or any part.

Also would like to trade 2 100 H.P. each Allis-Chalmers squirrel cage motors, 440 and 2200 volts, with compensators and overload switches, for a 100 horse Cummins Diesel motor.

**BOX 508**
**PIT AND QUARRY PUBLICATIONS**
**538 S. Clark St. Chicago, Ill.**

## FOR SALE—A Good Time to Buy

Rotary Kilns 2 each 3x125—8x150—9x142'.
Crushers Gyr. 21K—8K—7½D—two 6K.
Loco. Cranes 40 ton Orton—35 ton Dus.
Asphalt plant Cummer one ton new '38.
Crushers Jaw 48x60—60x84—66x86.
Dredges two Diesel—one elect. Lighters (2).
Road Rollers (2) 10 ton 3 wh. gas—Bucket Loaders (2).
Bins Butler steel 3 comp.—150 yd.—300 bbl. cement.
Compressors 3 Sullivan WN102—500 ft.—Diesel '39.

**A. V. KONSBERG, 111 W. Jackson Blvd., Chicago, Ill.**

CRANE BARGAIN—NW ¾ yd., 40' boom. Loc. Chicago.
Universal full swing cat. crane, 28' boom. Mich.
Shovel Fronts—P&H ½, ¾, 1 & 1¼ yd. Msc. others.
SHOVEL—¾ yd. gas cat. Real low price. Ill.
CRANE—1 or 1¼ yd. gas cat., 45-50' boom. Chicago.
Belt Conveyors—B-G 24"x60' & 24"x80'. So. Mich.
Screens—Allis-Chalmers & Link-Belt 4x8. 2 deck.
Barber-Greene, Haiss & Nelson bucket loaders.
Washing and Stabilizer Plants—Cal. 100 yds. pr. hr.
Sauerman Equipment—Hoists, Buckets, & msc.

**JAMES WOOD, 53 West Jackson Blvd., Chicago, Ill.**

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**DIAMOND CORE DRILLING**
**HOFFMAN BROS. DRILLING COMPANY**
**PUNXSUTAWNEY, PA.**

We drill for any mineral. We have more than forty steam, electric and gasoline drills, adapted for any job. Satisfactory cores guaranteed. Our prices are right.

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## FOR SALE

MARION Model 37 Combination Steam 2-Yard Shovel and Crane.

BUCYRUS-ERIE Type B-3 Steam Shovel, ¾-yard dipper, Serial No. 11252. Reasonable.

**STUART M. CHRISTHILF & CO.**
**200 E. Lombard St. Baltimore, Md.**

## FOR QUICK REMOVAL

1—Class 14 2½ yd. Bucyrus—87½' boom.
3—30-ton standard gauge Davenport steam locomotives.
2—Type B Erie steam cranes.
3—Clamshell buckets.
8—Steel beam 12-yd. Western standard gauge side dump cars.
2—Jordan all steel standard gauge spreaders.
Equipment located at St. Mary-of-the-Woods, Ind.
Price reasonable for quick removal.

**THE W. T. WALSH EQUIPMENT CO.**
**3088 West 106th St. Cleveland, Ohio**

## WE LOOK INTO THE EARTH

By using Diamond Core Drills We drill for Limestone, Gypsum, Talc, Fire Clay, Coal, and all other minerals.

**PENNSYLVANIA DRILLING CO.**
**Drilling Contractors**
**Pittsburgh, Pa.**

## AIR COMPRESSORS

3½x 3" Gardner-Denver vert. size 2XX3.
14 x12" Gardner-Denver 573 CFM 55 lbs.
16 x14" Bury class DCB 30 lbs. 1220 CFM.
16 x16" Bury, 1100 CFM, 100 lbs.
7 x 6" Sullivan, 93 CFM, 120 lbs.

**Rebuilt—Tested—Guaranteed**

**Send for our new M-G & stock bulletins**

**CHICAGO ELECTRIC CO. 1334 W. Cermak Chicago**

## GRAVEL PIT FOR SALE

Approximately 118 Acres with Buildings, R.R. Spur into Property and gravel uncovered for immediate processing. Located near Pontiac, Michigan. Priced for immediate sale.

**WILLIAM G. STARR, Trustee**
**9th Floor, Detroit Bank Bldg. Detroit, Michigan**
**Phone Randolph 5390**

## WANTED: Additional Lines

Machinery representative and sales engineer at Akron, Ohio, seeks to represent manufacturer of portable conveyors and other sand, gravel and crushed stone equipment in the state of Ohio. 20 years' experience among pits, quarries and power plants. Address

**Box 308**
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## DRYERS

1 Slightly Used Monel Lined Dryer; 5/16" Tank Steel; Lined with No. 16 Full Finish Monel Sheets.
1 Used Hersey Dryer; 6'x30' Metalized Inside with Aluminum .015 thick.
For full particulars write

**JEFFERSON ISLAND SALT MINING COMPANY**
**Jefferson Island, La.**

## FOR SALE CHEAP

One 5-Ton (at 12' radius) Orton Crane, gasoline powered, 30' boom. ½ cu. yd. clam shell bucket, mounted on 5-Ton Sterling truck. Price $750, Located in Pittsburgh District. Address Owner

**BOX 304**
**PIT AND QUARRY PUBLICATIONS**
**538 S. Clark St. Chicago, Ill.**

## EQUIPMENT WANTED

1—Gas Operated Sand and Gravel Processing Plant, 400 tons finished capacity per day with 10" crusher.

**A. S. WIKSTROM**
**Contractor**
**Bound Brook, New Jersey**

## LOCOMOTIVES

CARS, BUCKETS, CRUSHERS, CONVEYORS, HOISTING EQUIPMENT, MOTORS, GENERATORS, HYDRAULIC WHEEL PRESSES.

**Buy, Sell, or Exchange**

**Industrial Equipment Corp.**
**P. O. Box 1647 Warehouse**
**Pittsburgh, Pa. Carnegie, Pa.**

## FOR SALE

5—Westinghouse, 75 H.P., 550 Volts, 3 Phase, 60 Cycles, 850 R.P.M. Full Load, Type CCL, Induction Motors, Constant Speed.

3—5'0" x 32'0" Rotary Dryers.

**STANDARD EQUIPMENT & SALVAGE CO.**
**2501 First Avenue, North**
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**POSITION WANTED**—Within next six months. Experienced plant manager with thorough knowledge of open and underground quarries, lime burning, shaft kilns, hydration, cost and maintenance. Successful record of handling labor. State salary.
Address

**BOX 528**
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## SAVE

Bolted type steel bins will cost you less erected than ordinary wood bins.

**New and Used Pipe and Tubing**

**Jos. Greenspon's Son Pipe Corp.**
**Natl. Stock Yds. (St. Clair Co.) Ill.**

## FOR SALE

1—Heavy Duty ¾ yd. Bay City Shovel manganese dipper front, 40 ft. heavy duty crane boom.

1—Hercules Motor DRXB.

**CLIFFORD WATERHOUSE**
**Jackson Mississippi**

## WANTED

**Immediately**

Man to erect and operate for a contractor, a sand and gravel processing plant handling 400 tons finished material a day.

**Send replies to BOX 520**
**PIT AND QUARRY PUBLICATIONS**
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## 100000 ITEMS

- Motors
- Generators
- Transformers
- M G Sets

*Wire—Write—Phone*

**ERIE ELECTRIC MOTOR REPAIR CO., INC.**
**124 Church St. Buffalo, N. Y.**

## CRUSHER BARGAINS!

No. 20 Kennedy Standard Gearless Gyratory Crusher.
No. 25 Type "S" Kennedy Gearless Gyratory Crusher.
10" Newhouse Fine Reduction Crusher.
36" Traylor TZ Gyratory Crusher.
40"x24" Cedar Rapids Crushing Rolls.
12"x24" Universal Jaw Crusher.
9"x16" Universal Jaw Crusher.
9"x16" No. 2 Climax Jaw Crusher.

**Box 512**
**PIT AND QUARRY PUBLICATIONS**
**538 S. Clark St. Chicago, Illinois**

## WANTED

Chemist with experience in cement manufacture or research. Give full details concerning education, qualifications, experience, salary expected. Address

**BOX 532**
**PIT AND QUARRY PUBLICATIONS**
**538 S. Clark St. Chicago, Ill.**

## RENT OR SELL

4—3-yard Rex Truck Mixers on Mack Trucks.

2—1½-yard Jaeger Truck Mixers — Ford mounted—Excellent condition.

7—4-yard Rex Truck Mixers mounted on Autocar and Mack Trucks—1937-8.

1—80 ton 2 compartment Blaw-Knox Bin.
Concrete Finishing Machine.
Rent new Diesel 315 Compressor and New Tools.

**THE JAEGER-LEMBO MACHINE CORP.**
**127-04 Northern Boulevard**
**Corona, L. I., N. Y.**
**Phone: NEwtown 9-7777**

## RAILS "1 Ton or 1000"

**NEW RAILS**—5000 tons—All Sections—All Sizes.
**RELAYING RAILS**—25,000 tons—All Sections—All Sizes, practically as good as New.
**ACCESSORIES**—Every Track Accessory carried in stock—Angle and Splice Bars, Bolts, Nuts, Frogs, Switches, Tie Plates.

**Buy from One Source—Save Time and Money. 'Phone, Write or Wire.**

**L. B. FOSTER COMPANY, Inc.**
**PITTSBURGH NEW YORK CHICAGO**

## ENGINEER WANTED

Sound medium sized equipment manufacturer wants sales or field engineer experienced in crushing, grinding, pulverizing fields. Fine opening for trained and ambitious man. Reply fully.

**BOX 504**
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## NEW WIRE ROPE FOR SALE

⅝", ¾", ⅞", 1", 1⅛", 1½", 1¾", 2", 2¼"

This cable is BRAND NEW IN EVERY RESPECT. SUITABLE FOR HOISTING, GUY LINES, SHOVELS, etc.

VERY ATTRACTIVE PRICES.

**TERRENCE P. WYNN**
**55 West 42nd St. New York, N. Y.**

## WANTED

**SALES ENGINEER** familiar with large contractors, public utilities, municipalities, Government agencies, suppliers of concrete aggregates, to sell well known line of up-to-date nationally known equipment.

**Send replies to**
**Box 524**
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**538 S. Clark St. Chicago, Ill.**

## LOCOMOTIVES SHOVELS—CRANES

### ATTRACTIVE PRICES

1—80 Ton American O-6-O Switcher

1—75 Ton Baldwin O-6-O Switcher

2—40 Ton American Saddle Tanks

1—38 Ton Vulcan Saddle Tank

1—38 Ton Porter Saddle Tank

2—25 Ton Plymouth Gasoline
**STANDARD GAUGE—RECONDITIONED**

---

1—Marion 480 Combination Steam Shovel & Crane

1—52-B Bucyrus Dragline Atlas Imperial Diesel Engine—70 ft. Boom

1—25 Ton Browning 8-C Steam Locomotive Crane

---

**Birmingham Rail & Locomotive Co.**
BIRMINGHAM, ALA.

---

1—REX 2½-3 yard capacity truck mixer.

3—Ingersoll Rand Size "D" Wagon Drills complete.

1—Midwest 10 ton, 36" gauge locomotive with self starter.

1—Ingersoll Rand Size 8 AFV pump with 60 HP., A.C. 3 phase motor.

1—Ingersoll Rand Size 8 AFV pump with 75 HP., A.C. 3 phase motor.

1—Barber Greene model "N" conveyor gas engine or electric motor.

2—Four ton, 36" gauge locomotives.

1—Ingersoll Rand type 34 Drill Sharpener.

1—Sullivan size DR-82 Drill Sharpener.

7—Chicago Pneumatic model 52 Wet Type Sinker Drills.

1—Ingersoll Rand Size 14 AFV pump with 300 HP., A.C. 3 phase motor.

1—Marion Diesel Electric 1½ cu. yd. shovel.

Also V shape cars, all sizes, pneumatic tools, generators, drill steel, etc.

**E. B. KELLEY CO., INC.**
**4387 Vernon Blvd., Long Island City, N. Y.**

---

## FOR SALE BY OWNER

1—Thew-Lorain 55 combination shovel, dragline, clam—in good cor dition.

1—Bucyrus-Erie 30—40' boom, dragline and clam bucket—comple ly overhauled this spring—good as new.

1—4 cubic yard Sauerman dragline power scraper outfit, complete with General Electric 150 H.P., 440 volt, 3 phase, 60 cycle motor and starting compensator.

1—Telsmith rotary screen—36" diameter, 24' long, 10' sand jacket.

General Electric induction motors—440 volt, 3 phase, 60 cycle, various speeds—all complete with starting compensators.

| | | |
|---|---|---|
| 1—½ h.p. | 4—5 h.p. | 1—25 h.p. |
| 1—1 h.p. | 2—10 h.p. | 3—30 h.p. |
| 2—1½ h.p. | 3—15 h.p. | 3—40 h.p. |
| 4—3 h.p. | | 2—50 h.p. |

All equipment located in Southern Michigan.

**BOX 536**
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538 S. Clark St. Chicago, Ill.

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### CRUSHERS—ELEVATORS—SCREENS SAND WASHERS—PUMPS CONVEYORS

1—7½"x13" CHAMPION No. 3 Jaw Crusher.
3—BRAND NEW Jaw Crushers 9"x15" and 10"x20".
1—9"x16" CLIMAX No. 2 Jaw Crusher.
1—12"x26" CHAMPION No. 6 Jaw Crusher.
1—No. 19 KENNEDY Fine Reduction Crusher.
1—No. 1 STURTEVANT Ring Roll Mill.
1—No. 0 STURTEVANT Ring Roll Mill.
1—48" dia. x 18' Allis-Chalmers trunnion mounted Screen with steel frame.
2—M-20 QUAKER CITY Hammer Mills.
2—3'x5' LINK-BELT Vibrating Screens.
1—No. 2 MEAD Disc Mill.

**JOHNSON AND HOEHLER, INC.**
Lansdowne, Penna.

---

## STANHOPE OFFERS!

### AIR COMPRESSORS
**BELTED:** 355, 528, 676, 1000, 1300 & 1570 Ft.
**ELECTRIC:** 478, 676, 807, 1302, 1722 & 2850 Ft.
**DIESEL:** 105, 315, 420, 603, 807 & 1000 Ft.
**PORTABLE GAS:** 110, 160, 220, 310, 540 & 1300 Ft.
**STEAM:** 49, 310, 528, 1300 & 2200 Ft.

### BUCKETS
50 Skips and Battleship Type, 2 to 6 Yds.
5 Owen & Bucyrus Rock Grabs.
**CLAMSHELL:** ½, ¾, 1, 1½ & 2 Yds.
**ORANGE PEEL:** ¾, 1, 1½, 2 & 3 Yds.
**DRAGLINE:** ¼ ¾, 1, 1½ & 2 Yds. Cap.

### CRANES & DRAGLINES
5 Ton BROWNHOIST, 30 ft. Boom Gas.
12 Ton NORTHWEST 50 Ft. Boom Gas.
12 Ton KOEHRING 45 Ft. Boom Gas.
16 Ton Speedcrane, Gas, 50 Ft. Boom.
25 Ton BROWNING & 30 Ton AMERICAN Locomotive.
25 Ton LINK BELT K-48 Electric, 70 Ft. Boom.
2½ Yd. Lorain Model 95, Diesel Dragline.

### CATERPILLAR SHOVELS
½ Yd. P. & H. Gas & ⅜ Yd. Insley Gas.
¾ Yd. KOEHRING Gasoline.
¾ Yd., 1¼ Yd., 2 Yd., 4 Yd. & 8 Yd. MARION Electrics.
1 Yd. NORTHWEST Gas & 7/8B2 Steamer.
1¼ Yd. BUCYRUS 41B Steamer.
1½ Yd. Lima 750 Diesel

### DUMP CARS
46—KOPPEL 1½ Yd. 24 & 30 In. Ga., V Shaped.
15—2 Yd., 3 Yd., 4 Yd. 36 In. Ga.
20—Std. Ga. 12 Yd., 16 Yd., 20 Yd. & 30 Yd. Cap.

### BALL, ROD AND TUBE MILLS
6x8 Continuous Pebble Mill.
5x5 Batch Mill.
5'x22" HARDINGE CONICAL Dry Ball Mill.
6'x22" HARDINGE CONICAL Pebble Mill.
4x8, 8x20 & 10x8 Straight Ball Mills.
8'x22" HARDINGE CONICAL Ball or Pebble Mill.
4x16, 5x18, 5x22, & 6x22 Tube Mills.
3½x8 & 5x7 Air Swept Tube Mills.
2x4½, 5x12 and 6x12 ROD MILLS.
4x16 Smidth Tube Mill Silex.
5½x20 Smidth Tube Mill Mang. Linck.
5½x18 P & M Tube Mill Silex.

### PULVERIZERS
No. 1 Sturtevant Ring Roll.
RAYMOND Auto. Pulverizer No. 0000, 0 & 3.
RAYMOND Imp Mills No. 4, 32 & 55.
GRUENDLER XXB Mill & Jay Bee No. 3 & 4.
RAYMOND 4 & 5 ROLL MILLS & 5 Ft. Chaser Mill.

### SEPARATORS AND COLLECTORS
14 ft., 8 ft. and 12 ft. Separators

### ROLL CRUSHERS
36x60 Fairmont Single Roll.
36x16 Allis Chalmers Double Roll.
36x20 Diamond Double Roll.
24x14 Pioneer Double Roll.
24x12 P & M Double Roll.

### JAW CRUSHERS
10x8, 13x7½, 14x7, 15x9, 15x10, 16x9, 16x12, 16x10, 18x11, 20x8, 20x6, 20x10, 20x12, 20x11, 26x12, 30x15, 30x13, 36x30, 36x18, 36x14, 36x15, 36x9, 36x6, 38x18, 36x10, 36x24, 42x9, 48x36, 60x42, 84x66, 36x16, 9x36.
30x10 Gruendler Roller Bearing.

### CONE & GYRATORY CRUSHERS
42 in. McCully Mammoth Gyratory.
18 in., 24 in., 30 in., 36 in. and 48 in. Symons Disc.
4—10 TT Traylor 4 Ft. Gyratory.
4—Nos. 5, 3 & 6 Austin Gyratory.
2—Traylor T-12 Bulldog Gyratory.
8 in. Traylor T. Gyratory, Telsmith No. 9.
17 Gates K—Nos. 3, 4, 5, 6, 7½, 8 & 9½.
10 Inch Austin Model 105.
6, 10 & 13 Inch Superior McCullus.
KENNEDY: Nos. 19, 25, 27, 39 & 49.
16" Traylor.
7 Ft., 5 Ft. and 3 Ft. Symons Cone.

### HAMMER MILLS
4 Jeffreys: 24x18-A, 36x24-B, 42x36-E & 42x48-B.
Williams No. 1 Jumbo Jr., & No. 6 Universal.
Nos. 4, 6 & 8 Williams Jumbo.
No. 36 Am. Ring Roll.
Gruendler No. 6X.

### HOISTING ENGINES
7 Gasoline 15, 40, 60 & 100 H.P.
17 Steam 7x10, 8½x10 and 10x12.
8 Electric 20, 35, 50, 60, 100 & 150 H.P.

### DRILLS
4—SANDERSONS 14 & LOOMIS 44.
7—Ingersoll-Rand Wagon Drills, FB & M2

### STEEL BINS
72 Ton BLAW-KNOX 2 Compt.: also 250 ton.
100 Ton BLAW-KNOX 2 Compt.

### CEMENT BIN
400 Bbl. Portable BUTLER Bulk Cement Bin with Fuller Full Automatic Electric Push Button Weigh Batcher.

### SYNCHRONOUS MOTOR GENERATORS
100 K.W. RIDGWAY 3/60/2200-250-275 volt
150 K.W. GEN. ELEC. 3/60/2200-250-275 volt
200 K.W. RIDGWAY 3/60/2200-250-275 v., 900 rpm.

### SLIP RING ELECTRIC MOTORS
52 H.P. GEN. ELEC. 3/60/220-440 v., 1200 rpm.
(3) 100 H.P. GEN. ELEC. 3/60/220-440 v., 900-1200 rpm.

### RUBBER HOSE
Air: ¼ in. to 1¼ in. Water: ¾ in. to 10 in.

### CONVEYOR PARTS
**BELT:** 1000 Ft. 60 In., 700 Ft. 42 In., 600 Ft. 36 In., 800 Ft. 30 In., 1642 Ft. 24 In., 517 Ft. 20 In., 297 Ft. 18 In., 1000 Ft. 14 In. & 16 In.
**IDLERS:** 36 In., 30 In., 24 In., 20 In., 18 In.
Head & Tail—Pulleys—Takeup for all sizes.
Steel Frames: 2,000 ft. 24 In., 30 In. & 36 In. Sections.

### ROTARY DRYERS AND KILNS
36 In. x 20 Ft., 3 Ft. x 30 Ft., 4 Ft. x 30 Ft., 54 In. x 30 Ft., 42 In. x 24 Ft., 5 Ft. x 30 Ft., 5 Ft. x 16 Ft., 5 Ft. x 60 Ft., 6 Ft. x 60 Ft., 8 Ft. x 70 Ft., 70 In. x 40 Ft., 5x30 & 8x84 Double Shell Dryers. 8x110, 7½x100, 8x125 & 10x20 Kilns.

### STEEL DERRICKS
**GUY:** 8 Ton 85 Ft. Boom, 15 Ton 100 Ft. Boom, 20 Ton 115 Ft. Boom, 50 Ton 100 Ft. Boom.
**STIFF LEG:** 5 Ton 70 Ft. Boom, 15 Ton 100 Ft. Boom, 25 Ton 100 Ft. Boom, 75 Ton 135 Ft. Boom.

### LOCOMOTIVES
**GASOLINE:** 3 Ton, 5 Ton, 8 Ton, 12, 14 & 30 Ton.
**STEAM:** 9 Ton, 20 Ton, 40 Ton, 60 Ton & 80 Ton.
**ELECTRIC:** 2 Ton, 5 Ton, 8 Ton, 17 Ton & 40 Ton.

### SCREENS
**VIBRATING:** 2x4, 3x6, 2x8, 3x8, 3x5, 4x5, 4x8, 4x10, 48x72, HUMMER, ROTEX, NIAGARA & ROBINS, LINK BELT & HURON.
**REVOLVING:** 3x12, 3x16, 3½x18, 3x24, 4x16, 4x20, 4x23, 4x24, 5x30, 5x20, 6x20.

### SAND WASHERS AND CLASSIFIERS
4 LINK-BELT A-60 In. Classifiers.
7 ALLEN Cones 4 Ft., 5 Ft., 6 Ft., 8 Ft. TELSMITH 13 Ft. by 2 Ft. 8 In. Screw Washer.

### RAILROAD CARS
12—50 Ton Cap. Battleship Gondolas.
7—50 Ton Cap. Flat Cars.

### SAUERMAN DRAG AND SLACKLINES
1—¾ yd. Gas 1—1½ yd. Electric
1—1 yd. Electric 3—2 yd., 3 yd. & 4 yd. Electric

**R. C. STANHOPE, INC.**
(Cable Address: "STANEQUIP" New York)
**875 6TH AVENUE, NEW YORK, N. Y.**
Pennsylvania 6-3565 or 6-3566

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## SURPLUS EQUIPMENT

### CRANES
1—10 Ton Gasoline Type, on Caterpillars.
3—20 Ton Locomotive Type, Standard Gauge.
1—30 to 40 Ton Locomotive Type, St. Ga.

### ELECTRICAL EQUIPMENT
3—300 K.W. G.E. Rotary Converters.
1—300 K.W. G.E. Switchgear, Semi-Automatic (new).
3—300 K.W. G.E. Transformers.
15, 25 and 30 h.p. G.E. Type KT motors.

### GOLD MACHINE (In Wyoming)
1—Complete Ainley Placer Gold Machine, 4 Bowl, Dragline Operation.

### LOCOMOTIVES (Steam)
4—51 Ton Baldwins, 17x24, Standard Gauge.
1—60 Ton American, 20x26, Standard Gauge.
2—77 Ton Baldwins, 19x26, Standard Gauge.
4—80 Ton Porters, 22x26 Standard Gauge.
1—80 Ton Baldwin, 22x26 Standard Gauge.

### SHOVELS (Diesel and Electric)
1—½ Yd. Thew Electric Type S, Mining Crawler Type.
1—3½ Yd. P & H Diesel 900, on Caterpillars.

### DUMP CARS
175—20 Yd. Koppel and Western, Std. Ga.

### PUMPS (Steam)
7—Camerons, 49 to 248 G.P.M.
1—Prescott Duplex, 8x5x10.

### HOISTS
Electric Tugger 65—6½ to 45 h.p. 220/440 volt, 3 phase, 60 cycle.
1—No. 750, Type C, Kewanee Steam Htg. Boiler.

**BUTLER BROTHERS**
*Producers of Iron Ore*
**137 East 8th St. St. Paul, Minn.**

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## SHOVELS—CRANES

1—Lorain-77 Diesel Shovel 1½ yd. new 1937.
1—Koehring 301 Gas Shovel 1 yd. No. 1183.
1—Marion-21 Electric Crawler Shovel ¾ yd.
1—Lorain-40 Truck-Shovel attachment ¾ yd.
1—Northwest No. 4 Backhoe 47" bucket, overhauled.
1—Byers "Bulldog" Backhoe 25" and 37" buckets.
1—Universal Truck-Crane No. 1114, 4-sp. Mack, pneumatic tires, bargain.
1—Lorain-40 8½ ton Truck-Crane, 4-sp. Mack.
2—15 ton cap. Northwest No. 4 Gas Crawler Cranes, Nos. 3793 and 3489, 40-50-60-70' Booms, overhauled, excellent condition.
1—Northwest No. 4 Dragline 50' Boom, new style Fairleads, overhauled.
1—Lorain 75-B Gas Crawler Crane 45' Boom.

**GREY STEEL PRODUCTS CO., INC.**
74 Central Avenue Glen Rock, N. J.
Tel. Ridgewood 6-2275

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## CRUSHING EQUIPMENT

1—21-K GATES ALLIS-CHALMERS with Air Hoist and 20 Ton Chain Falls

2—No. 6-K GATES ALLIS-CHALMERS

LOCOMOTIVE CRANE

SHOVEL—PUMPS—SCREENS
*In splendid condition.*

NO *REASONABLE OFFER* REFUSED.
These Machines in Montreal, Que.

*PHONE, WIRE OR WRITE*

**FRANKEL BROTHERS LIMITED**
**Don & Eastern**
**TORONTO, CANADA**

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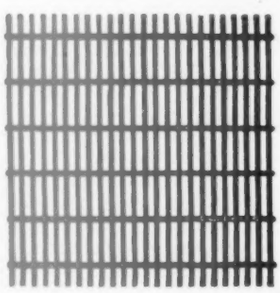


Rolled Slot

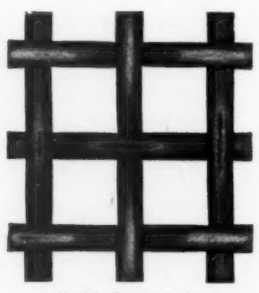
# ALLOY No. 2

A super wearing Steel developed to resist the abrasion and vibration of modern screening demands.

"CLEVELAND" SCREENS

A wire cloth of guaranteed accuracy backed by fine workmanship and an effort to satisfy.

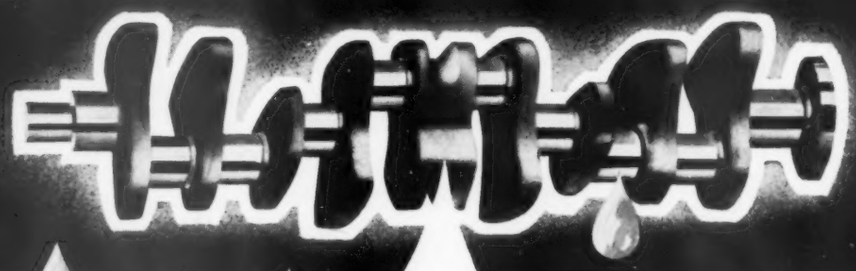
Available in Square Mesh and Rolled Slot. A trial will convince you of the superiority.



2 Mesh .162 Ga.

**THE CLEVELAND WIRE CLOTH & MFG. COMPANY**
574 E. 78th St. CLEVELAND, OHIO

# Would you lubricate the bearings?



## Then Lubricate WIRE ROPE!

***(IT HAS A THOUSAND "BEARINGS" PER FOOT)***

A wire rope is a machine and should be so treated. Every component wire bears upon its adjacent wires and in operation they slide and rub against each other. Just as the crank-shaft bearings in your automobile need lubrication, so do these multiple bearing pressures in wire rope.

A penetrating wire rope lubricant properly applied forms a film even on the inner wires and keeps those invisible "bearings" from wearing or corroding. It adds greatly to the life of your ropes, drums and sheaves, and contributes materially to rope safety.

TRU-LAY Preformed rope and the proper lubricant are a perfect team to obtain maximum rope service and economy.

An American Cable Division representative will gladly assist you with your lubrication or other rope problems.

**AMERICAN CABLE DIVISION**
**WILKES-BARRE, PENNSYLVANIA**
*In Business for Your Safety*

District Offices: Atlanta, Chicago, Detroit, Denver, Los Angeles
New York, Philadelphia, Pittsburgh, Houston, San Francisco

**AMERICAN CHAIN & CABLE COMPANY, Inc.**

# It's a money-making loader!

HERE'S one of the *handiest* . . . most *versatile* . . . and *profitable* machines you can invest your money in!

It's a "Caterpillar" Diesel D4 Tractor with a Trackson Traxcavator . . . low in first cost . . . economical with fuel . . . and adaptable to so many kinds of work that it's an all-around, general "handy man"!

In other words, when it isn't high-shoveling material into trucks and wagons, this outfit can turn-to at mixing, supplying crushers, cleaning up, excavating, scraping, ripping and hauling. (It has a drawbar like any other "Caterpillar" Diesel Tractor; and a bulldozer can be attached in a matter of minutes!)

The outfit shown is owned by Chaffin & Jenkins, of Provo, Utah. Loading out gravel in a lime quarry, it shuttles between stock-pile and haul-trucks . . . *handling 60 tons an hour!* And when it comes to cost, you can figure that this size "Caterpillar" Diesel usually needs only about 1½ gallons of low-cost fuel an hour!

See your nearest "Caterpillar" dealer, or write direct to the factory for more information on this "Caterpillar" Diesel D4 Tractor with a Trackson Traxcavator.

**CATERPILLAR TRACTOR CO., Peoria, Illinois**

# CATERPILLAR

REG. U.S. PAT. OFF.

**DIESEL ENGINES AND ELECTRIC SETS • TRACK-TYPE TRACTORS**